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MEMOIRS

OF THE

ROYAL ACADEMY

OF

SURGERY,

At PARIS:

CONTAINING,

A great Variety of CASES

In the chief Branches of the ART.

Many of them

Very surprising and uncommon.

Translated from the ORIGINAL dedicated to the FRENCH King.

VOLUME I.

LONDON:
Printed by E. CAVE, at *St John's Gate.*
M.DCC.L.

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M. de la PEYRONIE's

PREFACE.

THE Sciences continue long in a ſtate of infancy, their progreſs is a work of much time, and even the longeſt and moſt ſucceſsful labours leave a void, which cannot eaſily be filled up: In ſhort, perfection ſeems to retire in proportion to the efforts made to attain it.

Surgery is one of thoſe ſciences which has been cultivated with moſt care: but though neceſſity, the learning, induſtry, and united labours of various centuries, have made ſuch diſcoveries as greatly promoted its improvement; yet there are none but perſons of ſuperficial underſtanding, who can imagine that the boundaries of our Knowledge are thoſe of Surgery itſelf. The variety and multiplicity of our diſorders, their cauſes which are ſo latent, and the helps we want, preſent us with but too large and unknown a field, where we are inceſſantly reduced to ſtrike out new paths for ourſelves.

The queſtion then is, What method Surgeons ought to take to bring their art to perfection? Should they wait the progreſs of that experience which is acquired by practice alone, which ſo often renders the Surgeon intolerably vain, and impoſes on the vulgar? No. If the knowledge to be gain'd by ſuch experience could have brought Surgery to perfection, the art would have been perfected ſome centuries ago.

But in order to perfect Surgery, there are other things neceſſary to be known, full as eſſential, and more difficult to be acquired, which muſt concur with practical obſervations. And the knowledge of theſe particulars, to which too many Surgeons are

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ſtrangers, is the reſult of phyſical experiments. Thus it appears, that the truths which enrich our art, ſpring from two ſources, Obſervation and experimental Philoſophy; the neceſſity of both which may be eaſily demonſtrated.

Nature diſcloſes herſelf but in an obſcure manner; for which reaſon we ought to examine her ſteps ſtrictly, follow her wherever ſhe goes, and obſerve her operations. But in making obſervations, the mind is no more than a bare ſpectator, and only ſees, as it were, the outſide of objects: we muſt have recourſe, therefore, to phyſical Experiments, in order to penetrate into the ſenſible principles of nature; or, in other words, we muſt be before hand with her, examine, and force her to diſcover herſelf.

Obſervation, and phyſical Experiments, which are the foundation of Surgery, have then very different objects in view; for the former comprehends the ſenſible qualities of bodies, the courſe of diſeaſes, their ſymptoms, and the effects of the Surgeon's medicines and applications: whereas phyſical Experiments diſcover the ſtructure and functions of the parts, the compoſition of mixt bodies, the qualities of the circulating fluids, the nature of aliments, and the action of medicines.

But theſe neceſſary helps of Obſervation and phyſical Experiments, do not ſeparately lead us to thoſe hidden truths which improve our art; for Obſervations ſtrengthen Experiments, and theſe again confirm Obſervations; ſo that they mutually ſupport each other. Thus, if it is neceſſary to obſerve exactly the ſubjects which we examine by phyſical Experiments, we muſt afterwards compare theſe Experiments with Obſervations, and conſider them together. Hence it appears that Obſervation and Experiments are, as it were, the two lights which ought to re-unite, to diſſipate the obſcurity of our art.

But Obſervation may be either imperfect or fallacious;

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cious; it has equally given birth to error and truth, and opinions directly oppoſite have frequently had the ſanction of an equal number of Obſervations to ſupport them. Before experimental Philoſophy began to be cultivated, Phyſic and Surgery were almoſt entirely founded on practical Obſervations; and theſe could not produce an uniformity of ſentiments amongſt practitioners, becauſe they adhered the more ſtiffly to their different opinions, as they thought nature declared herſelf more ſtrongly in their reſpective favour. Obſervations, alone, are therefore no more deciſive, than thoſe ambiguous oracles, or equivocal laws, which either intereſt or prejudice interpreted juſt as they pleaſed.

The Antients were of opinion, that the choice of particular parts of bleeding was not an indifferent matter. According to their notions, the opening of certain veins and arteries in thoſe parts which lay near each other, and, what is ſtill more ſurpriſing, even in the ſame parts, was dignified with the title of *ſpecific remedies* for very different diſeaſes. Theſe abſurd prejudices were notwithſtanding founded upon Obſervations; and a courſe of two thouſand years was not ſufficient to make the cloſeſt obſervers change their opinions in this reſpect; ſo that the diſeaſed gave up their blood and their lives to the caprice of Phyſicians and Surgeons, upon the credit of the moſt equivocal obſervations.

Such are the Obſervations which have infected theory with falſe opinions. Thus the blackiſh humor, which generally runs from cancerous tumors, induced the Antients to believe, that they were cauſed by an atrabiliarious juice: but phyſical, anatomical, and chymical experiments have taught us, that theſe tumors are only formed by the ſtagnation of a lymphatic humour; and at the ſame time informed us, that this humour is in certain caſes ſubject to a moſt fatal putrefaction.

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Obſervation likewiſe introduced into Surgery ſtill groſſer errors. Wounds are often ſucceeded by obſtructions, which all the practitioners accounted *defluxions*, and aſſerted that they proceeded from the weak texture of the parts; and, agreeably to this notion, they applied aſtringents to the fluids which ſtagnated about a wound, and ſuch remedies as would ſtrengthen the weaken'd fibres: but ſuch applications added new force to the cauſes they intended to remove, and thoſe obſtructions, which might have been eaſily remedied, became mortal, in conſequence of the operation of theſe medicines. And thus, all that accrued to the patients, from the moſt univerſally received obſervations, was an increaſe of bad accidents; which was not ſufficient to rectify the Surgeon's prejudices, but theſe fallacious Obſervations always prevailed, even in ſpite of the ill ſucceſs which ſhewed how bad they were.

Books abounded with the like abſurdities, which Obſervation conſecrated as truths authorized by nature, and the conſent of practitioners; and ſome ages paſſed, before anatomical enquiries, and phyſical diſcoveries could diſſipate theſe errors. Without theſe, freſh Obſervations might perhaps have led practitioners into new miſtakes; at leaſt, the ableſt Surgeons could not have got rid of moſt of the prejudices which had ſo long enſlaved the ancient maſters of the art: whence we may infer, that Obſervation can only be corrected by phyſical Inquiries.

But if Obſervations are to be corrected by phyſical Experiments, theſe latter, in their turn, require the aſſiſtance of the former; and the reciprocal teſtimony and agreement of both conſtitutes the characteriſtic of truth. Experiments may miſlead, as well as Obſervation: we may apply the conſequences we draw from them, to things which evince their falſity: whence it appears, that Experiments muſt be tried by the teſtimony of nature, in order to avoid thoſe errors

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rors to which they might otherwiſe give occaſion.

When the immortal *Harvey* had convinced the Phyſicians of his time, that the circulation of the blood was the principle of life, from a fondneſs, they proceeded to a contempt of all the opinions of the antients. They would no longer own, that there were remedies appropriated to particular parts, but aſſerted, that the circulation of the blood carries them through the whole body, and that they act equally on all its parts: but accurate obſervations at laſt forced the moſt obſtinate abettors of this doctrine to return to the opinions of the antients, as to the effects of remedies. The phyſical Experiments that diſcovered the circulation of the blood, did therefore produce erroneous opinions, which only Obſervation could deſtroy.

Again, Obſervation not only rectifies phyſical Experiments, but alſo ſuggeſts new ones, which, but for thoſe, perhaps would not have been tried. Thus, for inſtance, Surgeons learn'd from Obſervation, that a ligature ſtops the courſe of the blood in the veins, and that, therefore, it is neceſſary afterwards to ſlacken it, in order to facilitate the diſcharge of the blood through the orifice. The cauſe of this phænomenon remained long a ſecret, but at laſt curioſity was awakened, and the experiments it ſuggeſted diſcovered the myſtery of the circulation, which in conſequence illuſtrated the very obſervation which made that diſcovery. Thus Obſervation leads to Experiment, and Experiment illuſtrates Obſervation. Thoſe, therefore, who endeavour to bring the art of Surgery to perfection, ought to depart from, and recur to Obſervation, in order to confirm the conſequences which they deduce from phyſical Experiments.

This procedure of the mind would not be difficult, if no more was to be done than to reconcile ſome Obſervations with ſome Experiments. But at firſt ſetting out, difficulties occur on all ſides the moſt ſimple truths require a long ſeries of Obſervation and phyſical Ex-

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Experiments, and when these Observations and Experiments are grown very numerous, their relations and the consequences resulting from them must be sought for. After these first Efforts, we are still so little advanced, as only to arrive at an imperfect Knowledge, and when truth appears more clearly, we hardly ever see its boundaries or consequences; so that we must wait patiently till fresh facts enlarge our knowledge. Thus, after some progress, we enter into a new course of Experiments, Facts and Observations.

As we advance in our knowledge of some diseases, we meet with proofs of the vast pains which new discoveries cost the mind. Contusions on the head often proved mortal. The first step to be taken in such an accident, was to seek for its causes by an anatomical Inspection. From dissecting dead bodies, Surgeons learn'd, that extravasations of blood occasioned the death of wounded persons: whence they concluded, that it was necessary to open the cranium, in order to discharge the extravasated fluid. But from other inquiries it appeared, that extravasations are not the only assignable causes of death; for others, not less fatal, have been discovered, and in which no relief could be had, but from the Trepan. Besides, more violent blows or contusions than those which sometimes cause extravasations, and are succeeded likewise by the most dreadful symptoms, have, nevertheless, not been attended with such accidents as endangered life. When the cranium, therefore, in such cases, has been opened by the trepan, it has been hazarding an operation as useless as it is painful, which has been neglected in other cases, not seemingly so terrible, and where it was absolutely necessary.

Such are the new difficulties which arise from Experiments, in proportion as their number increases. The violence of the contusion, and the symptoms attending it, has in all these cases been no certain sign of an extravasation, or an indication of the necessity

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of the trepan: Hence, in ſuch a perplexing multiplicity of ſymptoms, the Surgeon is obliged to ſearch for leſs dubious ſigns: now it is only by collecting and comparing all the Obſervations and Experiments, that more determinate and certain indications have been diſcovered. Perhaps other diſcoveries will occaſion freſh doubts, which muſt be cleared up by further Inquiries.

It is therefore certain, that the lights which illuſtrate the healing art, are nothing but the reſult of an infinite number of practical Obſervations, phyſical Experiments, and trials ſuggeſted by both theſe in conjunction. But ſuch lights are not to be expected from the Obſervations and Experiments of any one man. There is a neceſſity likewiſe for correcting thoſe Obſervations, which are diſperſed throughout the works of our predeceſſors and contemporaries. Without this labour, the greateſt genius will make only an ignorant and preſumptuous practitioner: for if he enters upon practice, without the knowledge to be met with in the writings of theſe authors, the building which has required the labours of ſo many ages to erect, will be the very ſtructure he will raſhly attempt to rear. Now can the greateſt genius, and who is withal moſt indefatigable, flatter himſelf, that he alone ſhall be able to collect all the materials requiſite to the compoſing ſuch a work? Can he even collect the thouſandth part of them, in the moſt extenſive practice? Can it be imagined, that the Reflections and Obſervations which have exhauſted ſo many great genius's, will occur to one perſon, whoſe life is ſo ſhort, and his time beſides taken up with an infinite number of different avocations? It muſt be owned, that the healing art is either ſhort of perfection, or abounds with error, even in the works of the moſt learned authors on that ſubject: What muſt it be then in the hands of men unpoſſeſſed of thoſe treaſures which ſo many writers have acquired in the ſtudy of nature?

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It is no more than a contemptible ſketch, which vanity, prejudice, and intereſt may cloak with the titles of judgment, reputation and experience; words which always impoſe on the multitude, and ſo often ſcreen ignorance under the appearances of knowledge.

The exerciſe of the art, and the manner of gaining that experience whereon it is founded, manifeſt the weakneſs of attempts, which a practitioner, with no other helps than his own abilities, can make.

The particulars neceſſary to be known ſucceed each other, and fall gradually in our way. Many years muſt paſs over a man's head, before he can flatter himſelf with having ſeen more than a ſmall ſhare of what is known to men, who have employed a ſhort time in the peruſal of good authors. Beſides, theſe matters are darken'd by each other, and perpetually changing. Here nature confirms our notions, and there ſhe contradicts them. In ſome caſes, what appears vaſt, is minute; and in others, what ſeems to be confined within narrow bounds, is very extenſive. Now if men of the greateſt abilities could not diſtinguiſh truth exactly amidſt ſo many difficulties, it is not to be imagined, that a practitioner can arrive at the knowledge of it by his own obſervations only.

But ſuppoſe that, in order to get che cloſeſt view of nature, a perſon makes himſelf maſter of all the helps which the known Obſervations and Experiments jointly furniſh; yet this labour, joined with the largeſt practice, would not be enough for his purpoſe: for beſides this, not a ſingle diſcovery of all thoſe which Surgeons make every day in the courſe of their practice, ſhould eſcape his knowledge. Without this ſtudy, the moſt ſkilful practitioner in twenty years time will be ignorant of ſuch particulars, as are familiar even to young Surgeons. The labours of others cut out work for him; and without a freſh ſtudy, the knowledge he has will fall into diſrepute, on account of his ignorance of new diſcoveries.

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Continual ſtudy is as neceſſary in practice, as in anatomy. Now if an anatomiſt be not at all ſolicitous to inform himſelf of new diſcoveries in his art, his labours will be no more than a ſervile taſk, an imitation, a repetition of the labours of his predeceſſors. In vain would he flatter himſelf that he ſhould be able to make new diſcoveries with relation to the ſtructure of the parts. He might indeed diſcover ſomething by chance, which had eſcaped other anatomiſts; but for want of being guided by the improvements that are daily made, his progreſs would be very ſlow, and perhaps he might diſcover nothing more than he had ſeen in his firſt diſſections. There are ſome, who in a courſe of thirty years have inceſſantly employed themſelves in diſſections; and though, during that time, conſiderable improvements have been made in their art, yet they have remained ſhamefully ignorant of them.

Such were the celebrated practitioners who were cotemporary with *Harvey*. Content with the knowledge they had gained from the writings of their predeceſſors, they ſhut their eyes againſt the light which this great man held out to them; and followed their profeſſion, for the greateſt part of their lives, ignorant of the circulation of the blood, which diſcovers ſo many errors both in the writings and practice of the antients. Their juniors, enlightened by this diſcovery, juſtly deſpiſed theſe haughty practitioners, who grew old in their errors.

Theſe ſentiments run directly counter to the notions of thoſe practitioners, whoſe ſlender experience makes them imagine, that they diſcover in their repeated courſes of anatomy, which is their ſole employment, thoſe truths that tend to perfect the healing art. A celebrated Phyſician, apprehenſive he ſhould forget his art, when he was forced to leave off reading, and give himſelf entirely to practice, uſed every year to examine, not what numbers of ſick

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perſons he had ſeen, but what progreſs he had made in the knowledge of diſeaſes. And the great *Boerhaave* made it an inviolable rule to divide his time between ſtudy and practice.

If Surgery requires ſo much pains and application, Is it not forming a wrong notion of it to reduce it to the art of manual operation? This art is doubtleſs eſſentially neceſſary, and is that chiefly which characteriſes Surgery; but conſidered in itſelf, it depends only upon a knowledge of anatomy, and a dexterity of the hand, which practice gives, but not the genius and knowledge which ought to direct and regulate it.

Thoſe, therefore, who judge of Surgery by manual operation alone, or who believe, that it is nothing more than a long ſeries of operations that forms a ſkilful Surgeon, are groſsly miſtaken. To form a better judgment of it, let us examine the operations as they are in themſelves; and theſe may be reduced either to ſuch as are deſcribed in books, or to ſuch as vary according to the parts on which they are performed, and the diverſity of caſes in which they are uſed.

The place then of ſuch operations as are deſcribed, is always fixed, the courſe of the hands is directed, and the ſeveral ſteps of the operator regulated. Now, can the habit that will guide a Surgeon in a road, where every ſtep he is to take is particularly ſpecified, and which he cannot miſs, be a deciſive proof of the capacity of this Surgeon? Thoſe Surgeons who build their merit on this habit alone, at once leſſen themſelves, and aſperſe their profeſſion: For do not young Surgeons of no great abilities, after ſome trials upon dead bodies, perform theſe deſcribed operations with as ſteady a hand, and as much ſucceſs, as could be expected from operators to whom a long habit has render'd them familiar? And do not ignorant perſons daily perform ſome of the niceſt of theſe operations upon animals? Why may not they then boaſt of their dexterity, ſkill, and ſucceſs?

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The beſt operators are therefore juſtly agreed, that a practitioner, ſervilely tied down to the rules of performing theſe operations, is no better than a workman attached to a wretched practice, which is often fatal to the patient, and always prejudicial to the improvement of the art, as will be made very evident by a few examples.

There have been Surgeons who, all their lives, have confined themſelves to a ſingle operation, without bringing it to perfection, but left it at their death in the very ſame ſtate as when they firſt performed it. A *Lithotomiſt* who has choſen a particular method, will not venture to quit it, to have recourſe to others, which in ſome caſes would be leſs dangerous. He will not venture to aim even at thoſe degrees of perfection, with which other Surgeons have practiſed his method. Thus it appears, that his habit or long experience is produced by timidity, or a prepoſſeſſion, which makes him neglect all other methods, however ſafe they may be. And does not this boaſted habit likewiſe obſtruct the improvement of all other operations? When we knew no other method of ſtopping the blood in amputation, than the cruel application of the actual Cautery, *Parey* happily diſcovered, and taught us the method of tying up the veſſels: but was this method embraced by thoſe Surgeons who were habituated to dangerous or ineffectual methods? An hundred years after this very valuable diſcovery, their ſervile followers, who feared not putting the patient to intolerable pain to no purpoſe, were nevertheleſs afraid to tie up the veſſels: nor could this be effected, till ſome able, knowing, and reſolute men ventured to incur the cenſure, and perhaps the contempt of their cotemporaries, to bring the prepoſſeſſed back to a method ſo happily invented.

The antient Surgeons boldly and ſucceſsfully performed the operation for the Fiſtula; yet, to the ſhame of

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thoſe ignorant practitioners, who were ſlaves to the uſual methods, how many difficulties were raiſed towards the end of the laſt century, about having recourſe to an operation ſo familiar to the antient Surgeons, and which *Celſus* has ſo plainly deſcribed! In vain has *Aquapendente*, by treading in their ſteps, given us convincing examples of its ſucceſs. The modern Surgeons, blindly attached to methods which were often either uſeleſs or dangerous, had not found out that the only certain cure for a fiſtula was cuting, or inciſion; and had it not been for the general apprehenſions which the imminent danger of *Lewis* the fourteenth occaſioned in *France*, we ſhould perhaps ſtill have been ſtrangers to this operation, which has ſaved the lives of ſo many unfortunate people.

And, indeed, what miſchief may not be apprehended from this habit, or rather practice, which reſtrains a Surgeon to one method, and occaſions his proceeding in the ſame uniform manner, in the moſt different caſes? Certain it is, that moſt of thoſe operations, the manner of performing which is taught in books, want that ſimplicity which is ſo favourable to a ſettled method. Does not the Trepan, for inſtance, preſent us with abundance of variety? Are not the parts to which it is applied, and the diſorders requiring its application, ſo very different, that in all caſes they require a genius fruitful of freſh expedients? Does not the frequent application of the Trepan* depend on the diverſity of caſes and circumſtances which accidentally occur? In a word, are we not forced to forſake preſcribed rules, and look for others in the ſtructure of the parts, and the nature of the diſorder? Is it not, therefore, judgment, ſagacity, and knowledge, and not a ſervile habit, that ought to conduct the hand of the Surgeon?

If habit cannot direct the hand in thoſe operations which

* According to STALPART WANDER WIEL, in his obſervations, there have been contuſions on the head, which have made it neceſſary to apply the trepan twenty ſeven times.

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which are ſubject to ſtated rules, what can we expect from it in thoſe operations which differ as much as wounds and diſeaſes do? Is there a neceſſity for opening deep abſceſſes, penetrating into the texture of the parts to ſearch for extraneous bodies, removing mortal ſtrangulations, following fiſtulas, (the bottom of which cannot be come at by fingers or inſtruments) extirpating tumors ſurrounded by large veſſels, cutting a paſſage through tender parts, which muſt be injured as little as may be, or for laying carious bones bare, which require extraordinary operations? In ſuch caſes, where the operations have no fixed place, nor any limits aſſigned by rule, and where the aſſiſtance of the hand ought to be regulated only by the neceſſity of circumſtances, which always vary, What reſource can be had from this habit, which is formed by nothing but the repetition of ſome operations that have always been performed the ſame way? In theſe diverſified operations, therefore, it is, that the greateſt part of the art of operating conſiſts: whence it follows, that a ſurgeon who can only operate by written rules, can be of no ſervice in thoſe caſes, which are ſo difficult, frequent, and dangerous.

But neither do theſe degrees of knowledge, which are ſo neceſſary in ſuch caſes to conduct the hand, include the whole a Surgeon ought to know, as we have already obſerved: for the operation which they teach how to perform, and moſt ſtrikes the vulgar, is but a ſingle ſtep towards the cure of a diſeaſe. A knowledge of the caſes that require it, the ſymptoms which ſucceed it, and the treatment, which ought to be varied according to the nature and difference of theſe ſymptoms, Are not theſe the eſſential particulars of Surgery? If, for inſtance, a fracture happens, accompanied with a dangerous wound, the reduction, tho' frequently very difficult, is yet but a ſmall part of the treatment requiſite in the caſe; as Inflammations, Obſtructions, Gangrenes, Defluxions, profuſe Sweats,

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a Fever, Convulsions, and a Delirium, which often follow, require much more knowledge and sagacity than are needful to reduce the bones to their natural situation. A small share of practice, with the knowledge of the situation of the parts, industry and dexterity, suffice to reduce the bones; whereas a thorough insight into the animal oeconomy, the state of the wounded parts, the alterations of the fluids, and the nature of medicines, are helps hardly sufficient to remedy the symptoms succeeding such fractures.

Hence it follows, that the practice of Surgery requires a clear and thorough knowledge of the theory of the art. But the odd notions which the generality of mankind, and some Surgeons too, have had with respect to theory, make it necessary to bring them to the test. Mere speculations, and practical knowledge or experience, have been both confounded under the name of theory. By mere speculations, I mean those fictions of the imagination, those notions which are not drawn from the genuine nature of things; those principles founded upon possibilities and probabilities, those consequences which are so hastily and confidently deduced from them; such speculations can never constitute the theory of the healing art; they can produce nothing better than uncertain opinions, which nature generally contradicts, and time and reason soon make men forget. Nothing but imprudence, inconsideration, or want of judgment, can make them standing rules. From such speculations have arisen those systems which have mutually destroyed each other, and by turns amused mens minds. There have been those, that from a single truth, or a supposition, have endeavoured to deduce the healing art. A chain of arguments and consequences, built upon this tottering foundation, has often imposed upon men of the greatest parts and sagacity. Arbitrary and ingenious explanations, which furnish the imagination with answers to all difficulties, have been embraced,

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embraced, as if they were illuſtrations dictated by nature herſelf.

Such is the Theory too generally received, which has infected the ſchools; and cannot be too much deſpiſed: it is indeed very bewitching, becauſe it pleaſes the imagination, and by being ſo eaſy, diſpenſes with the labours and enquiries which are rewarded with a diſcovery of nature. The mind, blinded by vanity, is overjoyed to find in itſelf the principles of all things. It is in this kind of delirium, and upon imaginary foundations only, that philoſophers have erected the ſurpriſing machine of the univerſe; that eminent practitioners have aſſerted, that all diſeaſes originally proceeded either from an acid or an alcali fermentation, the thickneſs of the blood or lymph; and have confined the healing art to vain and fallacious indications, eaſy to be invented, but ineffectual in moſt diſorders. Such are the indications that have in a manner confined practice within the narrow circle of common medicines. When a Surgeon, in compliance with cuſtom, has ordered at random frequent bleeding, abundance of purgatives, ſudorifics, and topics, he is apt to imagine, that he has exhauſted the remedies of his art.

It is therefore wrong to confound thoſe parts of knowledge, which conſtitute the foundation of the healing art, with thoſe imaginary hypotheſes which introduce nothing but inefficacy, error, and danger into practice. A knowledge derived from phyſical experiments, nature, and the operations of medicines, and founded upon the cauſes of diſeaſes, the obſervation of their ſymptoms, and the laws of the animal oeconomy, conſtitutes the true theory: without which there is neither art nor method in the treatment of diſorders. But ſuch is the force of prejudice, that the men whoſe great practice will not let them ſtudy, whoſe ignorance reduces the healing art to a few helps known even by the vulgar; the men, I ſay, who affect

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affect an insinuating simplicity, look with contempt upon those who divide their time between study and practice. They endeavour to bring theory into disgrace, and impose upon the publick, who are ignorant of its usefulness. Thus the grossest ignorance finds a too sure resource in credulity, to discredit that knowledge which alone can enable us to tread securely.

Theory, then, is no more than practice reduced into rules; which, however, notwithstanding the labours of so many ages, are ever restrained to a narrow compass. In these limits, where certainty forsakes us, the only guides we have left, are *analogy* and *conjecture*, and these are useful; yet, notwithstanding, nothing but those degrees of knowledge, on which they ought to be founded, can give them sufficient authority to influence the mind; and if conjecture and analogy are not established upon this foundation, they will prove fallacious guides.

In the enquiries of the mind, Conjecture and Analogy are springs of knowledge: Probability and the comparison of similar objects lead to researches, which sometimes end in the discovery of truth: but to proceed from Conjecture and Analogy to practice, as from a principle to its consequence, is a nice step, which may lead us into paths full of error and danger. This way of reasoning, therefore, ought not to be allowed men of weak and narrow understandings, and is hardly to be indulged to men of the greatest parts, and most extensive knowledge; at least, it ought not to be used without great restriction, in cases where life is at stake. It is easy to fall into error, but hard to get out of it; for the observations which might undeceive us, often confirm us in the most absurd opinions; instances of which are to be met with in all ages. The sagacious antients were misled by conjectures: they were too eager to trace things to their first causes; and in this unseasonable attempt, which the obscurity of their natural philosophy ought to have

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have made them ſuſpect, they accounted for moſt diſorders by the principles of the then prevailing philoſophy. The probability which miſled, and ſeemed to juſtify them, multiplied their errors. Many of the moderns, who are extravagantly fond of ſyſtems, and whom the new diſcoveries might have taught more caution, have, nevertheleſs, run moſt into imaginary ſpeculations; inſomuch, that conjecture has led them into abundance of groſs miſtakes, and the healing art, in their opinion, ſeems to have been only the dangerous art of forming conjectures. And Analogy has betrayed them into ſtill more unaccountable errors: thus they raſhly and obſtinately gave the *Peruvian* Bark, which experience had devoted to the cure of intermittent fevers, in continual, malignant, and hectic fevers, and thoſe cauſed by ſuppurations, &c. After having diſcovered the good effects of Mercury in venereal, and ſome other diſorders, they doubted not but it might prove an univerſal remedy in all chronical diſorders; and inſtead of confining themſelves to ſimple experiments, conducted by prudence, they gave it plentifully and boldly in Cancers, Ulcers, the Scurvy, &c. as an infallible remedy. Theſe deſtructive errors, which they could not part with, have ſpread further, by being perpetuated in works which impoſe on the credulous and ignorant. But notwithſtanding Conjecture and Analogy have been much miſapplied, and, it muſt be own'd, may miſlead weak and injudicious perſons, yet they may furniſh the cautious and able Surgeon with good hints and expedients.

In the profound knowledge which is the foundation of Surgery, conſiſt the merit and difficulty of the art; which at the ſame time ſhews from what hands we are to expect its improvement. Excellent Surgeons are as hard to be met with, as genius and learning, of which the former is the ſource of knowledge, the univerſal inſtrument; but (if I may be allowed the expreſſion) like the body, it becomes dull and

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languid when it is not exerciſed. The uncultivated mind is as incapable of diſtinguiſhing objects, perceiving their connections, and exactly following a chain of reaſoning, as the body is of agility and pliantneſs, after a long diſuſe of exerciſe. The mind then muſt be prepared to enter into Surgery, as well as into other Sciences: for, previous to the ſtudy of it, there is required a competent ſhare of that kind of knowledge, which explains the operations of nature, and without which, there is no arriving at thoſe truths that conſtitute the rules which ought to guide the Surgeon in the cure of diſeaſes.

The improvement of Surgery is wholly owing to thoſe Surgeons that follow'd theſe rules, of which number were *Lanfranck*, *Berengarius*, *Vidus-Vidius*, *Severinus*, *Fallopius*, *Veſalius*, *Hieronymus ab Aquapendente*, *Paræus*, *Magatus*, *Fabricius*, *Guillemeau*, *Pigray*, *Demarque*, *Thevenin*, *Scultetus*, and *Nuck*.* Theſe eminent men, whoſe minds were prepared by the ſtudy of the learned languages, cultivated by polite literature, and enriched with philoſophical knowledge, illuſtrated all the intricacies of Surgery. It cannot however be denied, that there have been men, who, without any other aſſiſtance than their own genius, left behind them laſting proofs of their ſkill in Surgery: but ſuch prodigies are rare, and the art would be confined within a very narrow compaſs, if its improvements could proceed only from a ſingle ſource, which nature opens ſo ſeldom.

The labours of theſe ſkilful practitioners haſten'd the progreſs of Surgery: but if Surgeons had joined their efforts, and formed ſocieties for further inquiries, would not its progreſs have been ſtill more rapid? How many Surgeons have buried valuable diſcoveries with them, which would not have been loſt, had they

* Theſe illuſtrious men united the title of Phyſician to that of Surgeon; becauſe, in moſt foreign univerſities, Phyſick is not ſeparated from Surgery, as it is in the univerſity of *Paris*.

been

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been depoſited with, and publiſhed by ſome learned Society! Men of generoſity, who had been the wiſer for them, would afterwards have enriched their own works and poſterity with them; and theſe diſcoveries would have been more correct, as upon their firſt publication they would have been liable to a rigid examination; and, laſtly, they would have laid a foundation for new diſcoveries, by exciting emulation and curioſity in others. Many are the advantages which Surgery has received from ſuch Societies, and which are never to be had from the labours of particulars: they are a kind of tribunals, which call for the labours of the learned from all parts, in order to conſign them to publick uſe, and the improvement of the Sciences. They eſtabliſh a commerce, in which the publick gains more than thoſe who carry it on; and the fund never fails, but remains from age to age a fruitful ſource of further improvements.

To collect theſe treaſures, and improve this fund, already ſo large and extenſive, was the *Academy of* SURGERY eſtabliſhed; this was the only advantage that Surgery could envy the other Sciences. And though this ſociety is but lately erected, Surgery finds its advantage, even in the delay; ſince other learned ſocieties have been preparing materials that will contribute to perfect it. Every branch of ſcience had been cultivated with great care and application. Natural philoſophy is enrich'd by numberleſs diſcoveries; Anatomy has exhibited to us the curious ſtructure of the organs; Chymiſtry, the conſtituent parts and compoſition of mixt ſubſtances; and Mechanics, in their preſent ſtate of perfection, may aſſiſt men of genius and induſtry, in making ſuch inſtruments and machines as multiply powers. It was time to employ theſe diſcoveries for the improvement of Surgery. The antients wanted moſt of theſe helps: they ſtudied only the outſide of nature, and knew no more of her, than ſhe preſented to their obſervation.

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tion. Our art, therefore, which meets with ſo many helps in the labours of the moderns, may conſequently make ſuch advances, as could not formerly be expected.

The plan propoſed by the Academy, is to eſtabliſh Surgery upon Obſervations, Phyſical Experiments, and Experience. In the uſe we ſhall make of theſe, we ſhall follow the rules already laid down. But the beſt part of its treaſures will conſiſt of Obſervations, of which the moſt common need not be rejected, becauſe they always contain a detail of different circumſtances, that are often more beneficial than the principal thing which drew the attention of the Obſervator: at the ſame time, we ſhall not neglect other Obſervations, which may poſſibly be ſuſpected, on account of their marvellous nature. Now if the marvellous has oftentimes impoſed upon credulity, it muſt be owned, that incredulity has ſometimes without reaſon rejected the marvellous. But ſuch Obſervations, notwithſtanding their exhibiting appearances which ſeem'd to deviate from the ordinary courſe of nature, have in time been verified by a ſucceſſion of facts ſo well atteſted, as to leave no room for any*doubt. Such are thoſe obſervations which evince the adherence of Stones to the bladder *a*, the ſucceſs of the *Cæſarean* Operation *b*, and Bronchotomy *c*; alſo the poſſibility of Hernias through the Foramen Ovale *d*. Thus Nature, by diſcloſing herſelf ſometimes to men, opens them, againſt their will, new paths, which, by reaſon of their obſtinate prepoſſeſſions, they could not ſee before, and which lead to a ſcientifical knowledge of the healing art.

* Thoſe who ſend us Obſervations of this kind, are deſired to ſupport them with all the requiſite Atteſtations, in order to their being preſented to the public.

a See *Memoir* xiii. *b* *Memoir* xx. *c* p. 457. *d* *Memoir* xxv.

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MEMOIRS
OF THE
Royal Academy of SURGERY at PARIS.

MEMOIR I. *By M.* PETIT.

ARTICLE I.

Remarks on Tumors formed by the Retention of the Bile in the Gall-bladder.

DISORDERS do not always diſcover themſelves ſo diſtinctly as not ſometimes to be miſtaken, eſpecially when they are complicated, becauſe then the numerous train of concomitant ſymptoms begets uncertainty, and often leads into error. We meet with too many inſtances of this fatal truth, when we endeavour to diſtinguiſh the kind and genuine character of moſt of the apoſtems formed in the cavity of the abdomen. The difficulty here proceeds not only from theſe apoſtems being leſs viſible and palpable, than thoſe of the external parts, but alſo, becauſe, in moſt, the ſymptoms are generally confounded with thoſe of various other diſorders, which accompany them, and are uſually either the cauſes or conſequences of them. This conſideration has induced me to relate ſome caſes in which theſe diſorders have been miſtaken, and afterwards to lay down the method of avoiding error on the like occaſions.

I. Obſervation by M. Petit, on a tumor of the gall-bladder taken for an abſceſs of the liver.

About twenty ſeven years ago, a lady had a tumor in the region of her liver, of ſo conſiderable a ſize, and accompanied with ſo ſenſible a fluctuation, that it was taken for an encyſted dropſy, and tapping accordingly performed; but,

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inſtead of ſerum, it diſcharged two pints of very green and glutinous bile.

II. Obſervation by M. Petit on a ſimilar tumor.

A few days afterwards, I was informed that a tumor, which was thought to be an abſceſs of the liver, being opened, inſtead of pus, diſcharged about a pint of green bile. I uſed my beſt endeavour to inform myſelf of the beginning and progreſs of theſe two diſorders, but could learn nothing more than that both proved mortal. Theſe obſervations, tho' imperfect, were of uſe to me.

III. Obſervation by M. Petit, on a tumor of the ſame nature.

Some months after, I was called in conſultation with ſeveral phyſicians and ſurgeons, to give my opinion of the nature of a tumor of the liver. After we had had a detail of every thing that had happened during the twenty days the diſeaſe had laſted, the gentlemen in conſultation concluded it was an abſceſs, and ought to be open'd, and appointed me to perform the operation.

I had hardly divided the ſkin, when I perceived a ſubſiding and diminution of the tumor, which recalled to my mind the idea of the bilious tumors juſt mentioned. I did not finiſh the operation, but, on the contrary, brought the lips of the wound together, in order to re-unite them. The gentlemen, aſtoniſh'd at this procedure, aſk'd me why I did not lay the abſceſs open to the bottom; upon which I told them what I had perceiv'd, and added, that, if I was not miſtaken, the ſuppos'd abſceſs was nothing more than the bile retain'd in the gall-bladder; and that the reaſon of the tumor's diſappearance during the operation, was, becauſe the bile began to be diſcharged, and actually ran out, and that the patient would ſoon evacuate it by the uſual paſſages. Accordingly, as ſoon as the wound was dreſt, the patient having an inclination to go to ſtool, parted with a large quantity of green bile, and

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and in four or five days, both the ſmall wound I had made, and the ſuppoſed abſceſs were cured.

After conſidering theſe facts, I recollected all the ſymptoms which may accompany diſorders of this kind, made different combinations of them, and imagined that I had found the ſigns which characteriſe them; and, in reality, they have been highly uſeful to me in practice.

Some time ago I was called in conſultation to a lady, afflicted with a tumor on the region of the liver, which was reckon'd an abſceſs, and the opening of it accordingly propoſed; but, on the contrary, I judged that the diſorder was not a ſuppurated phlegmon, but a tumor produced by the retention of the bile in the gall-bladder: And the reaſons I advanced made one of the gentlemen embrace my opinion, but the reſt followed their own. The tumor was opened without me, and I neither knew how it was open'd, nor the quality of the matter it diſcharged, but only learnt, by public report, that the wound remained fiſtulous.

IV. Obſervation by M. Petit, on the ſame ſubject.

Seven or eight months afterwards, the patient conſulted me for the cure of her fiſtula, which diſcharged a yellowiſh liquor; and it being of importance to know what it was, I was induced to taſte it; and from thence concluded it was pure bile. I have not ſeen the lady ſince, but have been informed that the fiſtula was dilated, and a bilious ſtone extracted, as ſuch are often form'd in the gall-bladder; but I needed not this laſt circumſtance to confirm me in the idea I had of this kind of diſorder.

V. Obſervation by M. Petit, on the ſame ſubject.

About eight or ten months ago I was deſired to be preſent at the opening an apoſtem in the region of the liver. The patient had been ſeized with an inflammatory diſpoſition of the abdomen,

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accompanied with a painful tenſion of the region of the liver; and a proper diet and liquors, ſome clyſters, and eſpecially two bleedings in the ſpace of twelve hours, had given ſuch conſiderable relief, that the patient thought he might ſafely leave off medicines. But he was miſtaken; for the inflammation of the abdomen, and the pain of the liver return'd, and from this time time the feces had no tincture of bile, whilſt the urine on the contrary was ſo loaded with it, as to appear brown. In twenty four hours, the whole ſurface of the body appeared as yellow as ſaffron, and a continual fever, with irregular ſhiverings, accompanied all theſe ſymptoms. Several bleedings, ſimple broths, aperitive diluents, laxatives, and proper topics were all us'd, by which means the patient was reliev'd, the abdomen ſoften'd, and the region of the liver render'd leſs painful; but there appear'd on it a very conſiderable tumor, in which the fluctuation was ſo ſenſible, that it ſeem'd abſolutely neceſſary to open it ſpeedily.

Nevertheleſs, the circumſtances of this diſeaſe, which ſeem'd moſt peculiarly to denote an abſceſs, did nót appear ſatisfactory enough to me; on the contrary, I perceiv'd that the tumor was only the conſequence of the retention of the bile, which paſſing no longer thro' the *ductus cholodochus*, had dilated the gall-bladder to ſuch a ſize, as to make it puſh the teguments of the abdomen outwards; whence aroſe the external tumor viſible to the eye, and the fluctuation, which was ſo very manifeſt to the touch.

When I had related the reaſons on which I founded my ſentiment, the gentlemen preſent were of my opinion, and all thoughts of opening it were laid aſide. Beſides, the ſymptoms were not now ſo urgent, and it was agreed that the patient ſhould be kept to the ſame regimen and medicines he had us'd for

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ſome days paſt. Next night the patient voided ſome feces a little ting'd with bile, and urine of a leſs browniſh colour; and from this time, the bile gradually flow'd ſo well, that in three days after they ſhewed us three pints, of a very greeniſh bilious matter, which the patient had diſcharg'd during the night. We found the tumor conſiderably diminiſh'd, and no longer painful. At laſt it diſappeared totally, the urine reſum'd its natural colour, the jaundice vaniſh'd, and the patient was quite cured in a ſhort time.

I have frequently communicated different obſervations of this kind to the public; and ſuch caſes are more common than is generally thought, and, perhaps, the miſtakes I have related will only appear new, becauſe the firſt who fell into them paſſed them over in ſilence: But miſtakes, in ſuch difficult caſes, are only overſights, when we have the courage to publiſh them; but become crimes, when through pride we conceal them.

However, curious as theſe obſervations may appear, they would nevertheleſs be of little uſe, if I ſhould not relate the marks, or ſigns, by which we may diſtinguiſh theſe two different diſorders.

It is firſt to be obſerved, that an abſceſs of the liver, and the retention of the bile in the gall-bladder, being moſt generally the conſequences of an inflammation of theſe parts, it is not ſurpriſing that the firſt beginning of theſe diſorders ſhould appear alike; for, in reality, both begin with a painful tenſion of the abdomen, eſpecially in the region of the liver. Afterwards, the bile is retain'd in its ſtrainers, or only flows very imperfectly into the inteſtines. It mixes with moſt of the other humors of the body, whence ariſe, a bitterneſs of the mouth, great thirſt and

Signs or conjectures by which we may diſtinguiſh theſe tumors from abſceſſes of the liver, or, by which we may at leaſt be taught ſuch a degree of circumſpection as may hinder us from deciding raſhly.

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and nauſeas; the urine is ting'd with bile, and ſometimes ſo conſiderably loaden with it, as to appear of a brown colour; whereas the feces which are deprived of the bile, look greyiſh or whitiſh. The bile ſpreads itſelf thro' every part of the body, even to the white of the eyes, and the whole body becomes yellow. The patients are afflicted with a general itching, and diſturb'd and interrupted ſleeps; a fever ſucceeds, and a hiccup, and vomiting; and ſeveral other ſymptoms, which need not be enumerated here, meet in the beginning of an inflammation of the liver, becauſe this inflammation attacks the ſtrainers of the bile.

If theſe ſymptoms continue and increaſe till the ſtate or height, then the diſorder will aſſume different appearances, according to the manner in which the inflammation will terminate.

If the inflammation be terminated by ſuppuration, and the ſuppuration be finiſhed, the pain and fever will be diminiſh'd, the patient will have irregular ſhiverings, and a tumor will appear on the right hypochondrium; and when the abſceſs is form'd on the convex part of this organ, this tumor becomes ſoft, and the fluctuation of the pus it contains may be felt. Theſe ſigns indicate the formation of the abſceſs, and the neceſſity of opening it. However, before we come to a determination, we ought to examine every ſymptom, and recollect and conſider every thing that has paſs'd during the courſe of the diſorder; for notwithſtanding all theſe appearances of an abſceſs, we may be deceiv'd; becauſe, ſometimes, all the marks or ſigns of an abſceſs I have now mention'd, ſeemingly appear where there is no abſceſs; but, on the contrary, the inflammation of the liver is terminated by reſolution.

To comprehend the poſſibility of this, we muſt obſerve, that the bile, which, during the height of the

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the inflammation, was not filtrated in the glands of the liver, begins to be separated as soon as the resolution has sufficiently disengag'd the glands of this organ. But if the resolution is not enough advanc'd to open the obstructed *ductus cholodochus*, the bile, which will enter the gall-bladder, cannot flow out, but will fill it, and be so accumulated in it as to push it outwards, and will occasion a tumor under the right hypochondrium, accompanied with a manifest fluctuation; this, joined with the irregular shiverings, and the abatement of the fever and pain, afford us signs like those of an abscess.

In this perplexing state, shall the surgeon run the hazard of opening the gall-bladder, in the supposition of opening an abscess; or shall he suffer the patient to die of the abscess, for fear of opening the gall-bladder? If this likeness of symptoms be capable of setting him wrong, yet an accurate and well-weigh'd comparison may shew such differences, as are not indeed discoverable at first view, but which are nevertheless sufficient to enable him to form a right judgment.

In a word, the abatements of the pain and fever, are equally the signs of a resolution, begun, as of a finish'd suppuration. But it is to be observ'd, 1. That the pain, which should have been equal in the two disorders, whilst both were only inflammations in their height, and as yet as much disposed to suppuration as to resolution, increas'd whilst the abscess was forming, and abated whilst the resolution was carrying on, and the bile was obstructed and accumulated in the gall-bladder. 2. The pain which accompanies suppuration is generally throbbing, and this kind of pain does not accompany tumors of the gall-bladder, as they do not generally happen, but when the inflammation of the liver terminates by resolution. 3. The pain abates much sooner when apostems terminate by re-

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ſolution, than when they end by ſuppuration. 4. The abatement of the pain, in conſequence of the reſolution, leaves the patient in a pleaſing and hopeful ſtate, whereas, notwithſtanding the abatement of pain in conſequence of a finiſh'd ſuppuration, he is always low-ſpirited, and ſo uneaſy, that the worſt is to be apprehended.

The irregular ſhiverings, in both caſes, do alſo differ; for, 1. Thoſe which accompany the formation of an abſceſs, laſt longer than thoſe produc'd by a retention of the bile. 2. In the former the pulſe is ſmall, and becomes more elevated when the ſhivering ceaſes. 3. The ſhivering attending ſuppuration is ſucceeded by an heat, and then by a moiſture of the ſkin; whereas, after the ſhivering cauſed by a retention of the bile, the ſkin is dry; ſo that this laſt ought not to be looked upon as a true ſhivering, but as a tranſient irritation which the diffus'd bile makes on the membranes and other nervous parts.

When an abſceſs of the liver is forming on the convex part of this organ, or when the bile is retain'd in the gall-bladder, the teguments are thruſt outwards, and we perceive a tumor on the right hypochondrium, but the tumor caus'd by an abſceſs differs from the other; for 1. It is not limited, but appears to be included in the neighbouring parts, and as it were buried in the teguments, which are generally oedematous; whereas the tumor occaſion'd by the diſtention of the gall-bladder is exactly diſtinct and apparent, becauſe it is rarely accompanied with an oedema. 2. The tumor formed by the gall-bladder is always ſituated below the ſpurious ribs, under the *muſculus rectus*; whereas the tumor ariſing from an abſceſs of the liver, has no particular ſituation, and may undiſtinguiſhingly poſſeſs all the parts of the epigaſtric region.

Laſtly, the fluctuation of the contents of theſe

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two tumors discovers itself in a different manner; for, 1. The fluctuation from the retention of the bile in the gall-bladder, is perceiv'd almost suddenly, whereas that of an abscess is long before it appears. 2. The fluctuation of an abscess is suspected long before it appears, whereas that of the bile discovers itself generally before it is suspected. 3. The fluctuation of a bilious tumor, even in the beginning, is not dubious, whereas that of an abscess, especially in the beginning, is such, that if several persons feel it, they are divided in their sentiments; and some even deny that there is any at all. 4. The fluctuation of an abscess appears not at first, but in the center of the tumor, and extends every day to the circumference as the suppuration increases; whereas the fluctuation of a tumor of the gall-bladder is at first almost as perceptible in the circumference as in the center; which happens because the bile included in the gall-bladder is fluid from its first retention, whereas the matter of an abscess does not become fluid but in proportion as it is changed into pus. 5. To whatever degree the suppuration of an abscess of the liver is carried, its circumference is always hard and swell'd, whereas in a tumor of the gall-bladder, when the inflammation is over, there is generally neither hardness nor swelling about its circumference.

These are the distinguishing marks which I have collected from amongst those which appear the same, and may be found together in very different disorders. I thought it expedient to examine them separately, before I consider'd the same symptoms, when an abscess of the liver, a retention of the bile, and bilious stones meet together. And that the reader may reap more advantage from the observations I have made on this subject, I judg'd it incumbent on me, to compare the disorders of the gall-bladder with those of the urinary bladder.

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ARTICLE II.

A compariſon between the retention of the bile and ſtones in the gall-bladder, and the retention of urine and ſtones in the urinary bladder.

THIS analogy that empowers us to do ſome things that we never did before, becauſe they have ſome relation with other things that we do habitually. Thus, for inſtance, becauſe the itch and cutaneous ulcers, which are cured by mercurial ointments, reſembled certain ſymptoms of the venereal diſeaſe, *Vigo* and *Carpi* imagined that the ſame application might be proper in this diſorder. To this happy conjecture we owe the diſcovery of a ſpecific againſt this dreadful diſtemper; which ſingle circumſtance proves the neceſſity of ſetting ourſelves to conſider the true relations and differences amongſt diſeaſes, of the ſame, as well as of a different kind; and as the diſorders of the gall-bladder, which are but little known, do in ſome meaſure reſemble thoſe of the urinary bladder, with which we are better acquainted, we ſhall try to diſcover the true ſigns of the former, and the proper method of curing them, by comparing them with the latter.

We know thus much already, that the gall-bladder is ſubject to retain the bile, and to contain ſtones, as appears from the preceding obſervations, which I read in a public aſſembly in 1733. We know that the urinary bladder is ſubject to the ſtone, and to a retention of the urine; that the urine which cannot be diſcharged, by its quantity produces exceſſive diſtenſions; and by its acrimony, irritations, ſucceeded by inflammations; and that theſe inflammations often terminate in gangrenous abſceſſes. In like manner, the bile retain'd in the gall-bladder, by its quantity or continuance there, occaſions inflammations, which terminate in gangrenous abſceſſes,

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ſceſſes, which prove mortal, when for want of knowing them the patient is left to his fate.

We likewiſe know that ſtones in the gall-bladder may either remain there, or be diſcharg'd by paſſing thro' the cyſtic duct, and thence into the *ductus cholodochus*, and alſo by ſtopping in either of theſe ducts, may occaſion a retention of the bile. In a word, theſe biliary ſtones may be diſcharg'd from theſe ducts, and fall into the *duodenum*, in the ſame manner, as ſome urinary ſtones may remain in the bladder, and produce a retention of urine, whilſt others force open the neck of the bladder, get into the *urethra*, and ſometimes remain there, or come away with the urine. Stones of the gall-bladder, dropt into the inteſtines, have often been found among the feces, and we frequently find thoſe in the urine which are diſcharged from the bladder thro' the *urethra*. Both theſe kinds of ſtones do ſometimes paſs thro' their reſpective ducts without giving any pain, becauſe they are ſmall and ſmooth, whilſt ſuch as are rough and much larger ſtick therein, and ſometimes till death, unleſs they are extracted. There are, however, ſtones which remain both in the urinary and gall-bladder, without producing any bad ſymptoms, becauſe they may either be ſo ſhap'd, or ſo ſituated, as not to obſtruct the natural courſe of the urine or the bile. I have found a conſiderable number of ſtones in ſeveral bodies, which I have diſſected in both theſe bladders, which the perſons when alive knew nothing of, becauſe they had never occaſion'd the leaſt accident during life; but this is not common, for moſt perſons who have ſuch ſtones ſuffer conſiderably by them.

Stones of the gall-bladder, compar'd with thoſe of the urinary bladder.

The ſymptoms accompanying theſe diſorders may well make us ſuſpect the exiſtence of ſuch ſtones, and by ſearching with the catheter, we may even be certain

certain of the preſence of urinary ſtones; but it does not ſeem poſſible to uſe the ſame method to aſcertain the exiſtence of bilious ſtones lodged in the gall-bladder; in which caſe we muſt be content with the ſuſpicion ariſing from the preſent or preceding ſymptoms. Theſe ſtones indeed may ſometimes be perceived by the touch, when the patients are lean, and the ſtones large, or many of them together. In this caſe, by touching the tumor form'd in the region of the gall-bladder by ſuch a collection of ſtones, we perceive a kind of craſhing, and even hear a noiſe like that of nuts included in a bag, as hath been frequently obſerv'd. We ſhall, however, afterwards ſhew, that there are particular caſes in which we may eaſily ſearch the gall-bladder, and by means of the probe diſcover the ſtones therein contain'd.

Having compar'd the ſtones of theſe two bladders, we proceed to compare the retention of the bile with that of the urine. The natural ſtructure and uſe of theſe two bladders eſtabliſhes the analogy between theſe two diſorders, and their ſituation, and the character and uſe of their reſpective fluids, conſtitute the differences.

Retention of the bile in the gall-bladder, compar'd with that of the urine in the urinary bladder.

When there is no obſtruction in the urinary or biliary ducts, theſe two bladders fill, and their contents are retained by their ſphincters, till they come to a ſufficient quantity to excite the fleſhy fibres of theſe two bladders to contract, in order to evacuate their contents; the one the bile into the inteſtines through the *ductus cholodochus*, and the other the urine out of the body by the *urethra*; and this is their natural function. But if by any cauſe whatever the *ductus cholodochus* does not perform its office, the bile does not paſs out of the gall-bladder, and a retention of it enſues. If any cauſe hinders the urine to flow thro' the *urethra*, there will be a reten-

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retention of urine, and neither of the bladders being able to empty itſelf, the fluid accumulated in it, will dilate it, and this dilation is ſucceeded by a painful tenſion, and an external tumor, which appears bigger or leſs according to the quantity retain'd. And if it happens that the urine, for inſtance, by greatly ſtretching the bladder, dilates, and makes its way through the *urethra*, and is in part diſcharg'd, then the patient, and even the phyſicians or ſurgeons, in caſe they neglected examining matters pretty narrowly, might imagine that, ſince the urine comes away, the retention has ceas'd; but they would be miſtaken, ſince the ſame obſtacle ſtill ſubſiſts, and ſince, after this evacuation, the bladder will be found to be almoſt as full as it was before the coming away of that quantity of urine. What is ſtill more apt to occaſion miſtakes is, that frequently, tho' the obſtacle ſubſiſts, the patients make water copiouſly, and ſeveral times a day; and that the urine, which in retentions generally comes away drop by drop, does ſometimes come away in a ſtream, as in the natural ſtate; with this difference, however, that it is not a continued ſtream, but a very ſhort one, and does not laſt long. This method of making water in retentions of urine, is preciſely what we call making water by *regurgitation*: we have frequently ſeen the ſame happen in a retention of the bile in the gall-bladder. Thus the bile retain'd may, like the urine, come away by regurgitation, and in this caſe the tumor of the bladder muſt diminiſh. But a perſon who was not to attend to this diminution, and who, beſides, might ſee the excrements ting'd with bile, might imagine that the tumor which appears on the region of the gall-bladder, was not form'd by the retention of the bile therein. But he would be miſtaken, for want of knowing or remembering, that what happens in a retention of the urine, when it flows

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flows by regurgitation, may happen in like manner from a retention of the bile. The following obſervation will ſhew, that there are caſes in which patients labouring under a retention of the bile, may diſcharge a large quantity of bilious excrements every day, though it cannot be concluded from thence that the bile has reſum'd its free courſe, ſince after this evacuation the gall-bladder is almoſt as full of bile as it was before. What is diſcharg'd from it, is only by regurgitation, that is, becauſe the obſtacle hath yielded a little to the force of the compreſs'd fluid. This very important remark I learned from the following obſervation.

VI. Obſervation by M. Petit, on a tumor of the gall-bladder occaſioned by a retention of the bile.

A man of 35 or 40 years of age had for eight or ten days labour'd under an hepatic colic, which was not diſcover'd by his phyſicians, though it was from the beginning accompanied with all the ſymptoms produc'd by an obſtruction of the liver, and a retention of the bile. The moſt conſiderable ſymptoms were abated by repeated bleeding, potions, and other remedies proper againſt an inflammation; but there ſtill remain'd a tumor on the region of the gall-bladder, which was by turns without pain, and alternately more or leſs painful, more or leſs elevated, and accompanied with a fluctuation ſometimes more and ſometimes leſs apparent. This tumor was judg'd to be a ſuppurated phlegmon, and accordingly every thing prepar'd for opening it, when the patient's friends propos'd a conſultation, in which the ſentiments were divided. However, when they had communicated their reaſons for their different ſentiments, they came to an unanimous deciſion. Thoſe who had the care of the patient before the conſultation, were not of opinion that the tumor ſhould be open'd, for any other reaſon, but becauſe they look'd upon it as an abſceſs. Thoſe who oppos'd this operation,

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peration, aſſerted, that the tumor was form'd by the gall-bladder's being dilated by a retention of the bile. To this it was objected, that there was no reaſon to ſuſpect a retention of the bile, ſince the patient diſcharg'd bilious ſubſtances by ſtool every day. This objection appear'd to be well grounded, and I ſhould hardly have held out againſt it, if I had not frequently obſerved, that there are circumſtances in which, tho' the bile is retain'd in the gall-bladder, yet the patients have bilious ſtools every day. This fact, which I related, determin'd them againſt opening it. In a few days the patient recover'd his ſtrength and health, but the tumor continued for ſome years.

Tho' this fact appears ſingular, it is nevertheleſs a neceſſary conſequence of the mechaniſm of theſe organs. Beſides, tho' the bile is retained in the gall-bladder, there are caſes in which this liquor may flow into the inteſtines; for example, if the obſtruction of the liver vaniſhes entirely, but an obſtruction ſtill ſubſiſts in the cyſtic duct, the bile will then be retain'd in the gall-bladder; but the bile to be filtrated in the liver, may daily flow through the hepatic duct into the inteſtines. This was preciſely the caſe of the laſt mention'd patient in the beginning of his diſorder; but afterwards, when the obſtruction of the cyſtic duct began to leſſen, it was ſenſibly diſcover'd, that a part of the bile, ſtopt in the gall-bladder, flow'd thro' the cyſtic duct; and this was ſtill better perceiv'd, when the patient recover'd his ſtrength; for though he appear'd entirely recover'd, yet his retention of bile was not cur'd, and during three years that I knew he follow'd his buſineſs, the tumor form'd by the gall-bladder was ſometimes conſiderably ſunk, and at others as prominent as when the diſorder was at the height, but gave him no pain. He preſs'd it when he perceiv'd any tenſion in it, and diminiſh'd its

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its bulk, by making part of the bile flow into the inteſtines. This method, however, did not always ſucceed; but it often happen'd that, during the night, and ſometimes in the day, the tumor evacuated itſelf ſpontaneouſly without his ſqueezing or perceiving it. He had ſometimes notice of this evacuation by gentle gripes, which prognoſticated that he would ſoon have a ſtool, and diſcharge a large quantity of bile. This, however, did not always happen immediately after the evacuation of his tumor, becauſe he was often coſtive; and as the retain'd excrements were lodg'd in the *colon* and *rectum*, the bile could not be diſcharg'd till it had ſtimulated the inteſtines to expel thoſe excrements which oppos'd its paſſage; and when the reſiſtance of theſe excrements was conſiderable, he was afflicted with a colic for ſome time before he went to ſtool. From all theſe obſervations we clearly ſee, that in this patient, the bile retain'd in the gall-bladder, did not flow into the inteſtines but by regurgitation.

Diſcharge of the bile by regurgitation.

If in ſome retentions of urine or bile, theſe fluids may be diſcharg'd from their reſpective bladders by regurgitation; in others, it may happen that both are ſo exactly retain'd, that not a ſingle drop can eſcape; which will produce very different ſymptoms. For inſtance, if the urine is retain'd, and cannot be evacuated, becauſe the patient has not an opportunity of having the aſſiſtance of a ſkilful ſurgeon, he muſt either die, or nature muſt make ſome efforts for his relief. In ſuch caſes we frequently find gangrenous abſceſſes form'd in the *pubes*, the *perinæum*, the *ſcrotum*, and other parts which the bladder touches in its exceſſive dilatation. It is univerſally known, that when theſe abſceſſes open ſpontaneouſly, the bladder or *urethra* are perforated, the urine comes away with the *pus*, and the patient is reliev'd and

and ſometimes cur'd. It is to the largeneſs of the opening which the pus makes, and to the ſtrength and goodneſs of the patient's conſtitution, that ſuch cures are to be aſcrib'd. The ſame accidents happen in the gall-bladder, when the bile is exactly retain'd in it. If an abſceſs ſucceeds, it extends itſelf, and makes different openings for itſelf in the adjacent parts.

Diſcharge of the bile procured by abſceſſes, ſucceeded by fiſtulas.

Amongſt the abſceſſes produc'd by the retention of the urine, ſome remain fiſtulous; and amongſt theſe ſome have been found in which the urine has made cavities, where it depoſites its gravel, which uniting, hath form'd ſtones of all ſizes, and of different ſhapes. It has alſo been obſerv'd that when the urine does not remain in theſe cavities, but has its free courſe, no ſtone is form'd. I don't doubt but ſuch as at firſt found ſtones in the *perinæum*, *ſcrotum*, buttocks, *abdomen*, and other parts in which the pus and urine had made paſſages, look'd upon ſuch phænomena with aſtoniſhment: But will they be leſs ſurpriz'd, if I ſhew them that the bile retain'd in the gall-bladder may produce ſimilar diſorders; that the inflammation of it, communicated to the adjacent parts, makes it adhere to theſe parts; that by the ſuppuration which ſucceeds, and the eſcares it ſeparates, this bladder is perforated; that the bile either comes away alone, or brings bilious ſtones with it to the adjacent and very diſtant parts, from that it naturally poſſeſſes; and that this is done in the ſame manner that the urine conveys ſtones to all the parts where it comes?

Openings of the gall-bladder ſucceeded by extravaſations of the bile into the abdomen, which have proved mortal.

In my firſt obſervations on this ſubject, three examples might have been obſerv'd, in which a tumor of the gall-bladder was open'd by thoſe that miſtook it for an abſceſs. Death ſoon ſucceeded the operation in the two firſt patients; but

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that perform'd on the third, was follow'd by no dangerous ſymptom. The ſymptoms preceding the death of the two firſt, were violent pains, a tenſion of the *abdomen*, the hiccup, vomiting, and other ſymptoms, which can juſtly be aſcrib'd to nothing elſe but the extravaſation of the bile into the cavity of the *abdomen*, and the action of that fluid upon all the *viſcera*. In purſuance of our deſign we proceeded to ſhew how important it is, not to reſolve upon opening theſe tumors, till we have deliberately and attentively conſidered both their origin and progreſs, and likewiſe the variation of their ſymptoms.

What I have ſaid is ſufficient to check the forwardneſs of young operators, who are always for cutting. But on the other hand it muſt be noted that an unſeaſonable timidity ought not to prevail ſo far as to make them loſe the opportunity of operating, even in caſes where they are perſuaded that the tumor is form'd by the dilatation of the gall-bladder, occaſioned by a retention of the bile, for if the two firſt obſervations ſhew that ſome of theſe tumors cannot be open'd without deſtroying the patient, the third proves that there are others which may be open'd with ſafety. It would therefore be uſeful to deliver the ſigns, by which they might diſtinctly diſcover theſe different caſes, ſo that they might act, or decline acting, with a knowledge of the cauſe, which is no eaſy matter. Nevertheleſs, to perform it as well as I can, I ſhall proceed to inquire whence it happen'd that the patient mention'd in the third obſervation was reliev'd by the opening of his tumor, and why the operation was ſucceeded by no bad ſymptom, except that he could ſeldom have a ſtool without a glyſter. We ſhall endeavour to clear up all the doubts which may be raiſed on this ſubject.

We

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We conceive at firſt view, that if the patients mention'd in the two firſt obſervations periſh'd by an extravaſation of bile into the cavity of the *abdomen*, the patient mention'd in the third muſt have had ſome particular diſpoſition which prevented ſuch an extravaſation; for if the bile had fallen into the cavity of the *abdomen*, as it did in the other two caſes, it would certainly have produc'd the ſame ſymptoms. Now I know of nothing but the adheſion of the gall-blader to the *peritonæum*, which can hinder ſuch an extravaſation; whence we may conclude that in the preſent caſe the gall-bladder adher'd to that part of the *peritonæum* where the opening was made, and of courſe that we ought to entertain the ſame notion of theſe tumors as of abſceſſes of the liver, which is, that they may be ſafely open'd when the gall-bladder adheres to that part of the *peritonæum* where we intend to make the inciſion. When M. *Mery* thought of the puncture of the urinary bladder in ſuch a retention of urine, where the catheter could not enter it, he judiciouſly choſe that ſide of the bladder above the *pubes*, which is not cover'd with the *peritonæum*, and the cellular texture of which immediately connects it to the other teguments of the *abdomen*; for the difficulty is the ſame in theſe two ſorts of punctures, as in opening abſceſſes of the *abdomen*. It being of little ſignification to diſcover them by the preceding ſigns, and the moſt manifeſt fluctuation, as we ſtill run a great hazard in opening them, unleſs we are fully convinc'd of the adherence of the tumor to the *peritonæum*. The opening the bodies of thoſe who have died on the ſame day, or the day after the operation, has often confirm'd this truth.

Why the gall-bladder may ſometimes be open'd without an extravaſation of the bile into the *abdomen*.

Thus in order to avoid falling into this perplexing caſe, and prevent our having any thing to reproach

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ourſelves with, before we undertake the opening or puncture of the gall-bladder, we ſhould be certain it adheres to the teguments, and know where the adheſion is, in order to make choice of the fitteſt place for the opening, when the operation is judg'd neceſſary: But how ſhall we be aſſur'd there is ſuch an adherence? The following obſervations will perhaps afford us ſome light in this particular.

VII. Obſervation on an abſceſs of the liver, which had a communication with the gall-bladder and the *colon*.

A gentlewoman about thirty years of age having been ſubject to an hepatic colic for ſome years, was frequently in imminent danger of death by the violence of ſome of the fits: In moſt of which ſhe complain'd of an intenſe pain in the region of the gall-bladder, in which, notwithſtanding her bulk (for ſhe was very fat) I diſtinguiſh'd by the touch a tumor form'd by the fulneſs of the gall-bladder. But the laſt fit was ſo violent, and the tenſion and inflation of the whole *abdomen* ſo ſudden and great, that no fluctuation could be perceiv'd. Notwithſtanding all attempts to relieve the patient the diſorder increaſed, and ſhe was two days ſenſeleſs, and extremely debilitated; but on the ſeventh day of the fit the pain was almoſt quite gone. As the reſt of the ſymptoms, however, continued, there was reaſon to fear a gangrene of all the *viſcera*, and we had no hopes of the patient's life, when ſeveral copious ſtools in the night conſiderably reliev'd her. She diſcharged a yellowiſh matter, but in too large a quantity and too pale to be thought bilious only; and in reality purulent matter was found mix'd with the bile, which made us judge that there was a retention of the bile, and an abſceſs at the ſame time. Theſe evacuations abated in the day, and next night the patient ſlept without going to ſtool; and by uſing a proper regimen was cur'd in a few days. After having

Diſcharge of the matter of an abſceſs with the bile by ſtool.

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having liv'd ſeven years without the leaſt ſymptom of her colic, ſhe was ſeiz'd with a malignant fever, which being neglected, becauſe ſhe was on her road to *Paris*, prov'd mortal there.

Being more curious to inveſtigate the marks of the diſeaſe, of which nature had formerly cur'd her, than to inquire into the effects produc'd by that which deſtroy'd her, I open'd her *abdomen*, and chiefly examin'd the liver and gall-bladder, both which were found adhering to the arch of the *colon*, and that to the *peritonæum*, the length of three inches; and I found the gall-bladder ſo ſmall, that a ſtone as big as a nutmeg quite fill'd it. This ſtone adher'd to all the ſides of the bladder, without leaving room for a ſingle drop of bile, ſo that this fluid flow'd into the inteſtine through the hepatic duct alone.

This obſervation is fruitful of particulars, whence proper inferences may be deduc'd to illuſtrate the preſent ſubject. Firſt it muſt be obſerv'd, that the liver and gall-bladder in this patient adher'd to the *peritonæum* and the *colon*. Now as an inflammation is the principal cauſe of the adherence of theſe parts, we may be certain, or at leaſt it may be preſum'd, that there is always an adherence in the parts of the *abdomen* where the *viſcera* have been inflam'd, eſpecially when the inflammation has often attack'd the ſame parts at different times, which was the caſe of the patient whoſe hiſtory I have now given, who in the courſe of eight or ten years had had more than twenty fits of the colic, in each of which the region of the gall-bladder was ſwell'd, hard and painful. So that it was natural to conclude that the parts affected in the laſt fit of this diſorder, adher'd to each other; and it is certain that the tumor might have been ſafely open'd, if the ſuppurated phlegmon, with which it was com-

Adherence of the liver to the gall-bladder, and of the gall bladder to the *colon*.

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plicated, had diſcover'd itſelf by a ſenſible fluctuation, which was not the caſe, as we have obſerv'd.

Fiſtula which penetrated into the gall-bladder, and afforded a paſſage for the bile.

A lady of about ſixty-ſix years of age, who had been ſubject to an hepatic colic, with a retention of bile in the gall-bladder for ſome years, was ſeiz'd with a tumor on the right *hypochondrium*, which inflam'd, ſuppurated, and burſt outwardly, and ſo reliev'd the patient. The opening became fiſtulous, and for a long time diſcharg'd only a limpid matter, but at laſt bile flow'd from it. The fiſtular cavity clos'd and open'd alternately; and the length of the diſeaſe, the fever, and the little nouriſhment the patient took, *&c.* put an end to her life. Upon opening her body, the gall-blader was found adherent as in the preceding caſe†.

The adherence of the gall-bladder with the *peritonæum* may permit an external aperture to give vent to the bile.

Theſe two obſervations reſemble each other in many circumſtances. Both patients were for a long time afflicted with an hepatic colic, and had a retention of the bile, a bilious tumor, a phlegmonous inflammation and ſuppuration; and both were reliev'd by the evacuation of the pus. But if the procedure of nature was the ſame, ſhe did not follow the ſame road; ſince in one of the patients the abſceſs burſt inwardly, and penetrated the inteſtinal channel, whereas in the other the pus made its way outwardly, by penetrating the muſcles and the ſkin of the *abdomen*; but a circumſtance in which theſe two tumors ſtill reſemble each other, and to which we are chiefly to attend in the preſent caſe, is that, upon opening both bodies, we found the gall-bladder adhering to the *peritonæum*, ſo that both caſes prove, that in hepatic colics, accompanied with inflammation, the affected parts muſt contract adherences, and may be open'd, if neceſſary, without any apprehenſion of an extravaſation.

To

† See afterwards M. *Dargeat*'s obſervation on this diſorder.

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To this proof or sign we shall add the following: 1. That if the patient lies on his left side, with his legs drawn up to his belly, and in this situation we strive to push the tumor from one side to the other, and we find it cannot be remov'd from the spot where it rises, it is a sign that it is adherent; whereas on the contrary it is a certain sign that it is not adherent, if it follows the motion of the fingers, and can be mov'd from side to side. 2. If there be a swelling œdema, or redness of the external part of the tumor, though these symptoms have only appear'd in some of the preceding attacks of the hepatic colic, we may be then certain that the tumor is adherent. In a word, if the surgeon has seen the patient in several of his fits, and made the strictest inquiry into the symptoms, he can hardly miss being satisfied in all these particulars, and being thence convinc'd that the tumor is adherent, and the patient in danger, he ought not to delay opening the gall-bladder; for it is not to be expected that nature should always perform miracles, tho' indeed she begins them, because she it is that procures these adherences, and that the opening the gall-bladder where there is no adherence always proves mortal. But it is the business of a skilful surgeon to observe nature, and not to act for fear of disturbing her, when he finds that she labours successfully, and to seize the favourable opportunity of acting himself, when he finds that she requires assistance, and cannot of herself perfect the work she has begun. We ought therefore to be very attentive to all the symptoms which discover these different cases to us.

Signs of the adhesion of the gall-bladder to the *peritonæum.*

If we can be sure of the adherence of the gall-bladder to the *peritonæum*, we may safely open the tumors on that part, by which means we enrich surgery with two new operations, one

New operations which may be perform'd on the gall-bladder, in consequence of its adherence to the *peritonæum.*

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of which may be perform'd when there is a retention of the bile in the extremeſt degree, and the patient in danger of death. This is the puncture which may be made in the gall-bladder with a trocar, in the manner invented by M. *Mery*, to procure a diſcharge of the urine from the urinary-bladder. He perform'd this operation frequently, and ſeveral other ſurgeons have done it ſucceſsfully, in caſes where it is impoſſible to introduce the catheter. The other operation whereby ſurgery will be enrich'd is lithotomy, which is the extraction of ſtones from the gall-bladder. The exiſtence of the ſtone, and the adherence of the gall-bladder being known, the operation may be ſafely perform'd in the manner I ſhall afterwards deſcribe. I ſhall only obſerve at preſent, that this operation may be compar'd to that perform'd on the urinary-bladder, to extract ſtones from it according to the method of the high apparatus.

Caſes which may require the puncture of the gall-bladder.

With reſpect to the puncture, and even the inciſion of the gall-bladder, it is certain they might be uſeful in ſeveral of the diſorders whoſe hiſtories we have already given, and amongſt the reſt in that of the man of forty-five years of age, who died of a retention of bile, and had more than ſixty ſtones in his gall-bladder*.

We may reaſonably ſuppoſe, that if the puncture, or even an inciſion, had been made in the tumor ſometime before, or even immediately after the appearance of the jaundice, the patient would at leaſt have been reliev'd, or perhaps totally cur'd; and there was no danger in performing the operation, inaſmuch as the gall-bladder adher'd to the *peritonæum*.

We ſee likewiſe that after the evacuation of the bile, the parts being no longer preſs'd, recourſe might

* See M. *Leaule*'s obſervation on this diſorder.

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might have been ſucceſsfully had to the proper remedies, to reſolve the indurations, and remove the obſtructions of the biliary ſtrainers.

Objections. But to what purpoſe is it to draw off the bile from the gall-bladder, if there are ſtones in it, which by their number, different ſize and ſhape, are capable of blocking up the cyſtic duct, continuing the retention of the bile, and producing mortal ſymptoms?

I anſwer that this is the very caſe in which a ſkilful ſurgeon has an opportunity of ſhewing his judgment, when he ought to attempt the extraction of ſtones from the gall-bladder; but he muſt firſt be certain of their exiſtence. We ſearch the urinary-bladder, in order to diſcover the ſtones combin'd in it. We ought alſo to ſearch the gall-bladder, and if we find any ſtones, muſt extract them as we do thoſe of the urinary-bladder. But the queſtion is how is this to be done? Why, in the following manner. The puncture of the gall-bladder being made with a groov'd trocar, we are to let part of the bile run off, and whilſt the reſt is running out, introduce into the canula of the trocar a button'd probe of a due length, and ſo pliable as to yield to all the inflexions neceſſary to make an exact ſearch in every part of the gall-bladder. Then, if we perceive any ſtone, we are to withdraw the probe, and, without taking out the canula of the trocar, ſlip a ſharp biſtory into its groove, and make as large an inciſion as we think proper, to open at once the teguments of the gall-bladder which adheres to them. Then we are to introduce the fore-finger of the left hand into the cavity of the bladder, in order to feel for the ſtones, and afterwards by the aſſiſtance of the finger a pair of forceps proper for this operation. We lay hold of the ſtones with this inſtrument, and extract them, after which we make a freſh ſearch with the finger or the probe, and

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and if we find any more ſtones, extract them as the others; and when we are very ſure there are no more, the patient is to be dreſs'd as we ſhall hereafter direct on another occaſion.

As this is not a proper place to treat thoroughly of this ſubject, let it ſuffice that I have given my thoughts of this new operation. But why do I call it new? It is not ſo, and I do no more than make one of the operations which were perform'd upon madam *Tibergeau*, at ſome months diſtance from each other. In reality this lady had a retention of bile in the gall-bladder, which was open'd on the ſuppoſition of its being an abſceſs; and the wound did not reunite, but remain'd fiſtulous. Some months after, the patient deſirous of having her fiſtula cur'd, ſubmitted to the operation propos'd to her, and accordingly there was found at the bottom of the fiſtula, that is, in the gall-bladder, a ſtone as large as a pigeon's egg, which was extracted.

Is not this performing the extraction of the ſtone, and doing it at twice, as ſeveral lithotomiſts formerly cut for the ſtone in the bladder? Abundance of perſons have died for want of knowing that they were ſeiz'd with this diſorder, or for want of a ſurgeon enterprizing enough to preſerve them by this operation. It may perhaps be wrong to call the ſurgeon enterprizing who ſhould propoſe this operation, for in reality if the gall-bladder when it is adherent may be perforated without any imputation of raſhneſs, it may be likewiſe ſearch'd with ſafety; and if there are any ſtones in it, he might be juſtly cenſur'd, who ſhould not dare to extract them, as on the contrary that operator would deſerve to be highly commended who did.

The following obſervations, which we ſhall give in the author's own words, ſeem greatly to confirm the truths we have endeavour'd to eſtabliſh.

A man

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A man of forty-five years of age, after ſome fits of a fever, and a cold of which he ſeem'd to be cur'd, fell into a conſiderable dryneſs and waſting; yet he complain'd of nothing except a ſhort dry and frequent cough; and as to the reſt had a good appetite, and ſlept well, but the digeſtion was bad. Being ſuddenly ſeiz'd with an univerſal extravaſation of bile, he call'd me to his aſſiſtance, and I examin'd the region of his liver, where at firſt I perceiv'd no great hardneſs, and the patient felt no pain in it.

VIII. Obſervation by M. *Leaule* on a tumor of the gall-bladder by a retention of ſtones and bile.

The tumor extended from the right *hypochondrium* beyond the middle of the epigaſtric region. His urine was copious, but turbid and red. His ſtools were whitiſh, and reſembling clay. In this ſtate, the patient, by the advice of an able phyſician, us'd the moſt proper remedies, as diluents, aperients, bitters, and gentle purgatives, but without relief. On the contrary, there appear'd another round hard tumor, ſituated above that before-mention'd, riſing manifeſtly prominent above the ſurface of the *abdomen*, and a plaiſter of hemlock with gum ammoniacum was applied to it.

The patient for ſome time had his appetite and taſte, but at laſt loſt both, and growing weaker every day died.

Upon opening him I found a tumor form'd by the gall-bladder on the right *hypochondrium*, along the edge of the ſpurious ribs, as far as the middle of the epigaſtric region. It was of the form of a large cucumber, and its upper part adher'd to, and was cover'd by the liver. Its fore part adher'd cloſely to the *peritonæum* on the ſide of the teguments. It preſs'd the liver againſt the ſpurious ribs and the diaphragm, and alſo preſs'd the ſtomach, epiploon, and colon, and had ſo ſunk all thoſe parts under the

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the arch of the diaphragm, that the liver had by this means loſt a great deal of its thickneſs.

This tumor was nothing elſe but the gall-bladder extremely dilated. I open'd it, and it diſcharg'd five half pints of a very limpid, but viſcid and bitter liquor, and I took ſixty ſtones of different ſhapes and ſizes out of it.

IX. Obſervation by M. *Dargeat* upon a ſcirrhous tumor which turn'd to an abſceſs, and was ſucceeded by a fiſtula, which penetrated into the gall-bladder, and gave vent to the bile.

A lady of about ſixty-five or ſixty-ſix years of age, was for ſeveral years ſubject to hepatic colics, and hypochondriacal vapours, when there appear'd on the right ſide of her *abdomen* a ſcirrhous tumor, which becoming larger and larger extended itſelf from the edge of the ſpurious, as far as the fore and upper ſpine of the *os ileum*.

It diſcover'd itſelf at a time when the patient was little afflicted either with her colic, or any other ſymptom which indicated an obſtruction of the biliary ſtrainers; for which reaſon ſhe neglected herſelf, till being attack'd by violent fits of the colic, a nauſea, a fever, and watching, ſhe call'd for aſſiſtance.

The ſymptoms ſhe then had were thought to be independent of the tumor of the *abdomen*, which to the touch appear'd only to poſſeſs the teguments. The patient was blooded, drank bitter broths, and then chalybeate waters, by which means ſhe was reliev'd; but for near three years ſhe had frequent returns of theſe ſymptoms, being always very coſtive, or having from time to time a bilious looſeneſs, and fits of a fever, which was ſometimes pretty regular, but moſt frequently very irregular.

The tumor of the *abdomen*, which till then had increas'd without pain, began to be painful. Emollient cataplaſms were applied to it for two months, at the end of which time, the tumor having ſuppurated, the ſkin open'd ſpontaneouſly, and the

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the diſcharge from this opening, which laſted ſeveral months, almoſt quite diſſolv'd the ſcirrhous tumor; after which the fiſtulous opening in the ſkin began to cloſe and open alternately, without any other ſymptoms than a ſlight pain in the part poſſeſſed by the tumor, and an obſtruction in the teguments, which diſappear'd when the fiſtulous opening was again open'd, and the matter flow'd, as it did immediately after the application of a cataplaſm of white bread and milk. An evacuation of a limpid matter ſucceeded, which was at firſt very copious, but afterwards diminiſh'd, and only flow'd at intervals. Beſides the pain, which the patient ſometimes felt after the cloſing of the fiſtulous wound, ſhe was from time to time afflicted with more intenſe pains, even whilſt the pus was freely evacuated from the fiſtula, which for this reaſon was judg'd to be a ſymptom of the hepatic colic; and this ſeem'd the more probable becauſe one day, when ſhe was grievouſly afflicted with pains, the fiſtulous wound ſuddenly diſcharg'd a large quantity of a fluid, which, by its conſiſtence, colour, and taſte, had all the marks of bile, and during the twelve firſt days might have amounted to two pints. The bile came away copiouſly ſeveral days, but diminiſhing by degrees, the diſcharge ceaſed totally in about eight or ten days, and the fiſtulous wound of the ſkin cloſed.

After this firſt evacuation of bile, the fiſtula continued to open and ſhut from day to day, furniſhing ſometimes a ſimple ſerous ſuppuration, in a very ſmall quantity, and at others pure bile more or leſs plentifully.

After the firſt evacuation of bile, the pains, the fever, nauſea, and the watching abated conſiderably, but recurr'd in about a month, and were ſoon after quieted again by a ſecond evacuation of bile, by the fiſtula, almoſt as copious as the firſt.

After

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After the ſecond evacuation, the diſcharge of bile became more frequent, and was not near ſo copious at each return.

The length of the diſeaſe, and eſpecially the frequent acceſſions of the fever, added to the little nouriſhment uſed by the patient, occaſioned a phthiſis and total colliquation, which was ſucceeded by an univerſal leucophlegmatia, and a looſeneſs which deſtroy'd her. Upon opening her body, her gall-bladder was found adherent as in the preceding caſe.

We began by introducing a probe thro' the fiſtulous cavity, to which the patient would not conſent during her life; and it penetrated above five inches, riſing obliquely to the gall-bladder, where we found a reſiſtance which hinder'd its going farther, and did not permit us to doubt what we at firſt ſuſpected, which was that the gall-bladder was open'd. And in reality, upon opening the *abdomen*, we found that the probe enter'd a ſpecies of ſtretch'd ligament, which attach'd the gall-bladder to the ſides of the *abdomen*, an inch and an half below the cartilaginous edges of the ſpurious ribs. This ligament, which was like a cord, was an inch and an half long, and hollow'd by a fiſtulous duct, one part of which communicated with the gall-bladder, and the other with a ſmall purulent bag, which was ſituated between the two *muſculi obliqui*, and emptied itſelf thro' the external fiſtula. The gall-bladder did not retain its uſual form, but had ſeveral elongations, three of which were larger than the reſt, in which we found certain ſtones lodg'd: one of them extended itſelf by the ſide of the fiſtulous ligament which open'd into the gall-bladder. Another was ſituated towards the mouth of the cyſtic duct, and the third lying between the other two advanc'd pretty far under the *inteſtinum jejunum*, to which the gall-bladder firmly adher'd. And it had not

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not only contracted an adherence with this inteſtine, but was alſo ſo united and confounded with the adjacent parts, that it could hardly be diſtinguiſh'd from them.

The cavity of the gall-bladder was very uneven, but not much larger than ordinary, though it was doubtleſs conſiderably dilated by the firſt evacuation of bile thro' the external fiſtula. Its membranes were very hard, and three times as thick as in a natural ſtate.

X. Obſervation by M. *de la Peyronie*, on a tumor of the gall-bladder, which open'd externally, and diſcharg'd ſeveral ſtones.

A woman of 37 years of age, and of a briſk and ſanguine conſtitution, having always enjoy'd good health, was ſeiz'd with a conſiderable heat of urine, and made lateritious water for fifteen days. Diluting remedies, along with a proper regimen, cool'd her urine, and render'd it clear and of a laudable quality.

Two years after ſhe had ſome fits of an hepatic colic, which occaſion'd violent and almoſt continual pain in all the epigaſtric region, but was moſt intenſe under the *cartilago enſiformis*.

The pain long reſiſted repeated bleeding, anodynes, and ſeveral other remedies; but yielded to the continuation of this method in about two months, at the end of which ſpace there appear'd a tumor near the region of the gall-bladder. It increas'd, and extended itſelf by degrees along the *linea alba* of the right ſide, an inch above the navel, and terminating by ſuppuration, burſt ſix months after its appearance. This tumor, from the gall-bladder where it began, as far as its aperture, was of the ſhape and ſize of a flattiſh cylinder of about an inch in diameter.

The wound furniſh'd about a porringer full of purulent matter, diverſified with different colours, as red, grey, and a deep green, and in which were five or ſix ſtones as large as a pea. They were ſpungy

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ſpungy and very ſmooth, light, brittle, and being held to a candle flam'd, and had the mark of ſtones form'd by the bile, and ſuch as are frequently found in the gall-bladder.

The patient was dreſs'd by a country fellow with a plaiſter, which was ſecur'd by a bandage.

The ſuppuration was ſo copious for two months, that ſhe was oblig'd to renew her dreſſing three or four times a day. The thick compreſſes ſhe uſed were continually wet thro' by the diſcharge, which was mix'd with whitiſh, reddiſh, lymphatic, and greeniſh matters. The diſcharge of the pus, in the courſe of ſix months, brought along with it about ſeven or eight ſtones of the ſame nature and ſize with the preceding. At the end of which time I ſaw her, and ſhe ſtill complain'd of being from time to time ſubject to nauſeas, languors, faintings, and pains like her firſt colic pains, but not near ſo violent. Theſe ſymptoms appear'd when the diſcharge from the wound was diminiſh'd, but as ſoon as it became copious ſhe was greatly reliev'd. The wound was fiſtulous, and its orifice was about a line in diameter. I introduc'd a common probe into it, which, without any great reſiſtance, went in about four inches before it got as high as the gall-bladder, where the tumor began to appear, when the violent fits of the colic ceas'd.

The probe probably remov'd ſome obſtacles which retain'd the matter in the gall-bladder; for, upon withdrawing it, the matter ran out plentifully, and brought along with it a ſtone like thoſe already deſcrib'd. The firſt diſcharge was white mix'd with red, and the laſt, with which the ſtone came away, was bilious, ſome of it was clear, and ſome of a deep colour.

As the length and curvature of the *ſinus* hinder'd me from ſearching the cavity whence this ſtone and the matter came, I determin'd to lay it open. There was

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was no danger in doing ſo, becauſe the *ſinus* was in the *corpus adipoſum*, and only cover'd with the ſkin. Accordingly after making an inciſion of about three inches in length, I ſaw pure bile diſcharg'd from an opening, which I obſerv'd near the middle of the *muſculus rectus*. The blood prevented my making farther obſervations, ſo I deſiſted till next day, and dreſſed the wound. Upon removing the dreſſing, the bile ſtill came away from the opening in the *muſculus rectus*. I paſs'd a crooked probe into the gall-bladder, into which it enter'd ſo far, that I did not doubt but I had convey'd it beyond the biliary pore, thro' the cyſtic duct, as far as the *ductus choledochus*. The cavity, which at its beginning was very large, was conſiderably leſs about two inches farther, and even ſhrunk up to ſuch a degree that the probe began to ſtick. When it was got to the depth of four inches it was almoſt faſt, and the patient told me that ſhe began to feel ſome pain, which made me immediately withdraw it; but as I drew out, I thought I perceiv'd ſome remains of a ſmall ſtone.

Since this operation, which was perform'd two years ago, the bile and other matters have been no longer retain'd, but continue to flow thro' the opening in the *muſculus rectus*, which adheres to the ſkin, where a fiſtula remains. Except in this particular the patient enjoys very good health, and is entirely free from the nauſeas, languors, faintings, and pains, which return'd from time to time, and brought her into a languiſhing condition.

From what has been obſerv'd we may conclude, 1. That if the ſymptoms return, and depend on ſome ſtones retain'd in the gall-bladder, we may, as able ſurgeons have done in like caſes, extract theſe ſtones thro' the opening of the fiſtula, by dilating it ſufficiently with prepar'd ſponge, or other remedies. 2. That if theſe ſymptoms return in

consequence of an inspissated bile, retain'd in the gall-bladder, or in the passages which ought to convey it to the intestines, we may attempt to dilate it by proper injections, and either evacuate it thro' the fistula, or cause it to flow thro' the *ductus choledochus* into the intestines, which is its natural road.

This observation, amongst other things, demonstrates the possibility there is, in some cases, of extracting stones from the gall-bladder with success, as we do from the urinary bladder.

XI. Observation by M. *Saura*, on an abscess of the *abdomen*, in which two biliary stones were found.

A woman of *Bellgrade* in *Gatinois*, of seventy-four years of age, had a colic, which was succeeded by an universal jaundice. She was frequently blooded, and used diluents, aperients, and gentle purgatives, which abated the symptoms; but afterwards a tumor appear'd on her right *hypochondrium*, which became an abscess, and left a fistula, which closed up from time to time. When this fistula was shut up the patient had violent pains, which were greatly reliev'd when it open'd again.

I had the management of this woman in the beginning of this disorder, but was oblig'd to leave her before she was entirely cur'd. I saw her again about a year afterwards, and she had then a considerable tumor on the right *hypochondrium*, nearer the *vertebræ* than the middle part of that region. There was a fistula duct, which corresponded to this tumor, and opened on the side of the navel a little under it. Finding the patient in great pain, because this duct or passage was clos'd up, I push'd my probe thro' a pellicule which shut it up closely, and a considerable quantity of bloody serum ran from it, and greatly reliev'd her. In following the course of the fistula, I felt a hard body with my probe in the tumor, which seem'd to be situated upon the muscles of the *abdomen*. To discover it, I made an incision from the

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the opening of the fiſtula into the body of the tumor, and laid hold of it with my forceps, and finding it adherent, ſhak'd it a few times to diſengage it, and extracted it, and immediately a yellow and bloody matter ran from the wound. I then cut away all the hardneſſes or calloſities, which I thought incapable of reſolution. The hard ſubſtance which I extracted, was a biliary ſtone, four inches in length, and three in circumference. It was ſmooth at one end, and had ſeveral ſmall cavities at the other, in which were little fleſhy excreſcences, which had form'd the adheſion. This operation being perform'd, I perceiv'd the opening of another duct, or paſſage, which went towards the oppoſite ſide, and penetrated beyond the *linea alba*, as far as the left *hypochondrium*, where there was no appearance of a tumor. I introduc'd my probe into this paſſage, about three or four fingers breadth, and found another ſtone, which I extracted, after having diſcover'd it, by lengthening my inciſion to the place where it was ſituated, and I cut away all the parts which I thought might retard the cure, as I had done on the other ſide. The wound in the right *hypochondrium* diſcharg'd a ſmall quantity of bilious matter mix'd with pus for ſome days; but nothing particular happen'd afterwards, and the patient was perfectly cur'd in about two months.

XII. Obſervation, taken from a letter wrote by Doctor *Habert*, on a biliary ſtone diſcharged by ſtool.

A lady being afflicted with a jaundice, accompanied with a colic, there aroſe, on her right *hypochondrium*, a tumor, which at firſt was not very perceptible, but afterwards became very conſiderable. Several remedies were preſcrib'd without ſucceſs, till at laſt bathing being order'd gave her ſome relief. The evening after ſhe had bath'd for the third time, ſhe was ſeiz'd with a vomiting, occaſion'd by the return of her colic, accompanied with convulſions, and a great diſcharge of blood by

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ftcol. And a ſtone of a brownish colour, mark'd like a ſhark's ſkin almoſt all over, was found in her fæces, which weigh'd three drams and an half, was two inches and an half long, an inch and an half in diameter, and three inches and an half in circumference. It was arch'd like the roof of a vault, and ſmooth at both ends; which made us ſuſpect that it was not the only one, and that there were at leaſt two others againſt which it had rubb'd: Nevertheleſs the patient was not obſerv'd to diſcharge any more afterwards. This ſtone was not of the ſame nature with thoſe generally found in the bladder and liver, for it was pinguious and bilious; as appear'd by this, that, notwithſtanding its ſolidity, it was eaſily pierc'd by a pin, and in the hole made by the pin a yellow ſubſtance, much reſembling the indurated yolk of an egg, was obſervable.

This obſervation was alſo communicated by M. *Dichand*, ſurgeon of *Tongres* in *Brabant*.

Sometime after the diſcharge of this ſtone, the patient parted with a kind of (putrified) bag, or membrane, by pieces. All theſe ſymptoms are gone off, the tumor is conſiderably diminiſh'd, and the patient, who had no appetite, but contrariwiſe a great naufea, drinks, eats, and begins to recover.

An Abstract *of several Observations on the Use of the* Trepan *in dubious Cases: In which an Inquiry is made into the Reasons which may induce a Surgeon, in the like Cases, to have recourse to the* Trepan, *or to avoid that Operation.*

By M. QUESNAY.

CASE I.

AMONGST the several signs which may induce a Surgeon to trepan, it is indicated by none more than fractures and depressions of the *cranium*. In certain cases, these fractures are not barely simple signs, indicative of this operation, but are, themselves, causes which require it; for if there is a depression or displacing of the bones, or if the brain or its membranes be wounded by some pieces of bone, and there be not a sufficient opening in the fracture for remedying these disorders, the trepan seems indispensably necessary, in order to restore the bones to their proper place, or to raise them. We have, however, instances of patients cured in some of those cases without having been trepan'd.

Fractures and depressions of the *cranium*.

M. *Ayellane* informs us, that a girl, of fourteen years of age, receiv'd a blow on the head, succeeded by a drowsiness, an inclination to vomit, and a delirium, occasion'd by a depression of the right parietal bone. These symptoms requir'd the trepan, but the girl's mother obstinately oppos'd the operation. The drowsiness and delirium lasted for three months, and kept the patient very weak, notwithstanding which, the bone rose by little and little, and all the symptoms at last totally disappear'd.

1. Observation by M. *Ayellane*, surgeon, at *Uzeal*, on a depression of the *cranium*.

M. *Duprey*

M. *Duprey* has alſo communicated an obſervation of the ſame kind, in which the patient was ſooner cur'd, tho' his wound was more complicated. A child of ten years old fell from an eminence fourteen feet high, and pitch'd on his head, whence aroſe two tumors, partly on the coronal, and partly on the parietal bones; one on the right ſide as large as an hen's egg, and the other on the left ſtill larger.

II. Obſervation by M. *Duprey*, ſurgeon, at *Evreux*.

M. *Duprey* open'd theſe two tumors, and found the two parietal bones uncover'd, the right the length of an inch, and the left a little more, accompanied with a fracture; one of the edges of the fracture was ſo depreſſed and ſeparated from the other, that it permitted a ſpatula to be paſſed into the cavity of the *cranium*. Beſides this fracture, there was a diviſion of the coronal ſuture, thro' which a probe was eaſily introduc'd. The depreſſion of the bones, and the extravaſation upon the *dura mater*, required the trepan, which was immediately agreed to, but nevertheleſs delay'd for ſome time, during which the operation became unneceſſary. The ſeparation of the bones, along with the poſture in which M. *Duprey* order'd the patient to be kept, procured a diſcharge of the extravaſated blood about the fifth day, after which the bone roſe of itſelf, and all the ſymptoms diſappear'd. On the fiftieth day a conſiderable portion of all the thickneſs of the external table of the left parietal bone fell off by exfoliation, and ſoon after the wound was cicatriz'd. The ſeparation of the bones anſwer'd the end of the trepan, for the evacuation of the extravaſated blood. Without this diſpoſition, the operation would have been abſolutely neceſſary, to make way for the evacuation of the extravaſated fluid. The fracture and diviſion of the ſuture ſuffer'd the bone to riſe the more eaſily, for being detach'd from the neigh-

Fracture with depreſſion, and diviſion of a ſuture.

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neighbouring bone, it yielded more readily to the efforts of the brain, and the action of the *dura mater*, ſo that theſe favourable circumſtances ſupplied the place of the trepan.

III. Obſervation by M. *Peyronie*, firſt ſurgeon to the king.

We have ſeen in M. *Avellane*'s obſervation, that the depreſſion was alſo cured without the trepan; but this diſorder was ſo long and dangerous, that inſtead of being diſcouraged, by this example, from trepanning, it ſhould ſeem on the contrary to evince the neceſſity of doing it in a parallel caſe. M. *de la Peyronie* likewiſe relates the hiſtory of a fracture cured without the trepan, the want of which tho' nature ſupplied, yet the cure was not ſo eaſily perform'd as if the trepan had been uſed. The patient, who was more than eighty years of age, had receiv'd a blow on the middle of the parietal bone, by a door, which made ſuch a wound, that the bone was laid bare and contus'd. The wound was dilated, and dreſſed with the remedies proper to procure exfoliation. M. *de la Peyronie*, being call'd into conſultation about the thirty-fifth day after the accident, found the *ſinus*, which he dilated, and by this means diſcover'd a fracture in the *cranium*. No ſymptom had yet appear'd, which gave any room to ſuſpect an extravaſation; and it appear'd ſo long after, that there was no neceſſity for trepanning. It was therefore reſolv'd to wait for the exfoliation; but, inſtead of an ordinary exfoliation, an uneven piece of bone came away, about as large as a half crown piece, conſiſting of the whole thickneſs of the *cranium*; it was ſeparated, and fell off in three months time, which removed the fracture, and laid the *dura mater* bare. This extraordinary operation of nature ſupplied the place of the trepan, which would certainly have been uſed if the fracture had been diſcover'd at firſt, and would

Fracture followed by an exfoliation of all the thickneſs of the *cranium*.

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not have been perform'd in vain; for, besides greatly shortening the cure, the kind of trepan which nature used in this case, shews, that tho' there was no bone displaced, nor any extravasation on the *dura mater*, yet the injury done to the *cranium* alone may require this operation. The following observation seems to confirm this remark.

IV. Observation by M. *Duverney*, on a fracture in the base of the *cranium*, which was not united three months after the wound.

A man receiv'd a blow on his head, which made no wound or contusion, but which was, however, succeeded by violent symptoms. It was determin'd to make an incision in one side of the head, but neither a fracture, nor any other injury done to the bone appear'd. Upon this, recourse was had to bleeding in the arms, feet, and jugular, and the other usual remedies, which abated the symptoms, but soon after the patient was seiz'd with convulsive startings, succeeded by so great a weakness, that he quite lost his senses, and died three months after the accident. Upon opening the part, we found a fracture in the base of the *cranium*, without any extravasation; it began at the fore part of the *mastoïd apophysis*, and went across the stony apophyses, and the saddle of the sphenoïd. The pieces of the fracture were separated from each other about a line's breadth; and nature seem'd to have made no effort to procure their re-union; whence we conclude that fractures, tho' not accompanied with any extravasation, may prove mortal, for want of a re-union; and, in such cases, the trepan is the only remedy, if the fracture be in a place where it can be applied. This favours the general rule, which is, that the trepan should be used wherever there is a fracture.

We ought to trepan in fractures and depressions.

We are, however, convinced by a great number of facts, related both by antient and modern surgeons, that many fractures and depressions of the *cranium* have

been cured without the operation of the trepan. These examples have long inclin'd some practitioners to believe, that more fractures of the *cranium* might be cured without than with the trepan*. Among these practitioners there are some very eminent ones; but their testimony is for this very reason of worse consequence to those surgeons who are conducted by authority only, since this opinion is not founded upon any solid reason. If they chuse to be govern'd by the symptoms: These signs are not near so certain as those they reject, that is, as fractures and depressions of the *cranium*; for the original symptoms are often either very slight, or none appear, tho' there is an extravasation within the *cranium*, or some hurt either of the brain or its membranes; whereas very bad symptoms are often produced by a simple commotion of the brain, where the trepan is useless, as we shall afterwards shew by a great many examples. Besides, if there be either no original symptoms, or we succeed so far as to remove them by bleeding, and a proper regimen, yet we have still the consequential symptoms to apprehend; and when these appear, 'tis often too late to make use of the trepan.

Where, therefore, we have no other guide but the signs from these accidents, they are to determine in consequence the operation of the trepan, because, on supposition that there is no manifest hurt of the *cranium*, they are the only signs which can determine us how to act. But when there is a fracture or depression, we ought neither to be guided by these symptoms, nor to wait for them, because we have then sufficient and less dangerous signs than these subsequent or consequential symptoms to direct us what to do. Those who imagine that fractures and depressions of the *cranium* might often be cur'd with-

* The principal authors who have embraced this sentiment are quoted in *Palfine*'s anatomy, and in *Rohault*'s treatise of wounds.

without uſing the trepan, have nothing to ſupport their ſentiment, but ſuch obſervations as, we have ſaid, evince that abundance of wounds on the head, attended with fracture and depreſſion, have been cured without the trepan. But ſuch obſervations, where nothing but the ſucceſs is related, without mentioning the indications which may conduct us to it, afford very few practical helps, eſpecially when theſe are contradicted by others, which are vaſtly ſuperior, both in reſpect to their number, and the ſafety accruing to the patients from them. Such obſervations therefore can only be look'd upon as cures done by chance, or as maſterly attempts, which depart from rule, and are ſo extraordinary, and ſo difficult to be aſcertained, that they cannot even be propos'd as exceptions to it.

There are, however, caſes which may of themſelves regulate the conduct of a ſkilful ſurgeon, and engage him at leaſt to ſuſpend the trepan in certain fractures where no ſymptoms happen, and which on the contrary are accompanied with ſome favourable circumſtances, which ſeem capable of ſupplying this operation. In the following obſervation, we ſhall ſee, that by acting with this caution, the trepan is not always abſolutely neceſſary in fractures of the *cranium*, and that we may even ſometimes omit making any inciſion to diſcover the fractures; But theſe caſes are rare, and require a very ſkilful and prudent ſurgeon.

V. Obſervation by M. *Gallait*, ſurgeon of *Granville*, on a remarkable fracture of the *cranium*, where the trepan was not neceſſary.

A child, of five years of age, fell from an eminence twelve or fifteen feet high, upon a barn floor. M. *Gallait*, who was called immediately, perceiv'd that the parietal bones were fractur'd, and that each of them had its particular fracture, becauſe the fontanel, which was not yet oſſified, had probably hinder'd the communication of theſe two fractures, at leaſt there was no mark

mark of a fracture in the fontanel outwardly, whereas in the oſſified part of the parietal bones, the fractures were very remarkable, becauſe one of the pieces of the fractur'd bones roſe very ſenſibly above the other, and yielded to the finger when preſſed, and roſe again upon removing it.

At the loweſt extremity of both fractures, a ſoft tumor aroſe, as large as a hen's egg; which M. *Gallait* open'd, without laying the fractures bare, becauſe he had no other view than to evacuate the extravaſated blood they contain'd. Beſides, theſe fractures were accompanied with no ſymptoms, which engaged him not to have immediate recourſe to the trepan; and, what ſtill more ſtrongly determined him to ſuſpend this operation was, that the pieces of the fractured bones, being, as we have ſaid, divided from each other, he imagined that each fracture might permit the blood, that ſhould happen to be extravaſated on the *dura mater*, to be collected in the tumors form'd at the lower end of theſe fractures, and that the opening of theſe tumors might be ſufficient to procure a diſcharge of this extravaſated blood. He contented himſelf therefore with gradually depreſſing the pieces of bones which had riſen above their natural ſurface, and keeping them in this ſituation by the *capeline*; which is a bandage proper for the purpoſe*. The patient was hardly at all diſorder'd during the whole cure, which was finiſhed in three weeks.

Diviſion of fractures may anſwer the end of the trepan.

This obſervation ſhews, that ſkilful practitioners are not always obliged to follow, ſervilely, even the moſt invariable rules of art; but, as we have already ſaid, they are not to be departed from without a great deal of judgment and ſagacity; for a ſurgeon could not juſti-

We may in certain caſes recede from the moſt invariable rules of art, but this ought to be done with judgment and circumſpection.

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* See it deſcribed in *Heiſter*'s ſurgery.

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by himself, by such examples, if the patient, whom he did not think proper to trepan in a fracture of the *cranium*, should happen to die; because in such cases, the safety of the patient requires that recourse be had to this operation, unless the fracture itself visibly answers the end of the trepan, by an opening large enough to extract or raise depressed or displaced fragments, or to furnish a passage to the extravasated blood, whether there be a piece of bone removed, or whether there be a division, which may certainly allow the extravasated blood to flow out. And there are even cases thus circumstanced, in which we may be easily deceived. For the separation may, indeed, be sufficient to procure a discharge of the blood extravasated on the *dura mater*; but sometimes the extravasation is under that membrane, and the aperture form'd by this separation is not always considerable enough to enable us to discover such an extravasation soon enough by the state of the *dura mater*, in which case we should only be apprised of it by symptoms, which frequently appear too late.

VI. Observation by M. *Boudu*, on a fracture of the *cranium*.

A young lady, apprentice to a carpenter, fell from the second story of a house to the ground, with a joist or rafter in his hands. He did not lose his senses, but immediately vomited, and bled at the nose and ears. Next day he was carried to the *Hotel Dieu*: M. *Boudu* examined a contusion he had in his head, and perceived an unevenness, which made him suspect that the *cranium* was fractured. He made a crucial incision on the middle part of the right parietal bone, and found two fractures which crossed that bone obliquely. One of them suffered the blood extravasated on the *dura mater*, to run out copiously thro' a small opening, or fissure, formed by the separation of the pieces of the fractured bone, tho' there was no fragment depressed.

It

It was thought this fracture might answer the end of the trepan, by giving vent to the extravasated blood. M. *Boudin* order'd him to be blooded, which was the fifth time, for he had been bled four times the day before. The same evening a vomiting succeeded, and next day bleeding was repeated. The patient had no fever or other symptom for three days, but on the fourth, which was the seventh of his disorder, he was seized with a fever, and vomited a bilious matter; and the two following days he was blooded four times, and the fever abated.

On the tenth day he was pretty easy, but afterwards complain'd of a violent head-ach, and fell into a profound sleep, which, however, was much disturbed, and he had also some irregular shiverings. All these symptoms made it suspected that there was an extravasation under the *dura mater*, which must be evacuated. On the fourteenth day of the disorder two trepans were applied, and an incision made in the *dura mater*, which gave vent to a spoonful of blood extravasated under that membrane, and which consequently could not be discharged by the fracture. After the operation, the patient was blooded four times in the arm, and once in the foot. He continued restless and delirious, and felt a sharp pain in the right *hypochondrium*; a considerable fever came on, and was succeeded by irregular shiverings, which made a suppuration of the liver suspected. At last he was seiz'd with a lethargic sleep, and died the seventeenth day after his fall.

Upon opening the part, the *pericranium* was found to be inflam'd and livid near the wound. The fracture of the *cranium* was composed of various fissures, the largest of which extended obliquely, from the inferior and posterior part of the right parietal bone, as far as the sagittal suture, where it formed a sort of V, and reach'd from thence as far as the

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poſterior part of the left parietal bone. The *dura mater* was in a manner callous and thick oppoſite to where the trepans were placed, and fungous oppoſite to the fiſſures or clefts of the fracture. The *pia mater* appear'd ſomewhat inflam'd, but the brain was in its natural ſtate: And on examining the *abdomen*, an abſceſs was alſo found in the great lobe of the liver.

Separation of the ſutures may prevent the neceſſity of the trepan.

The ſeparation of the ſutures may, as well as that of fractures, facilitate the diſcharge of blood extravaſated under the *cranium*; but this caſe deſerves particular attention, for the extravaſation may be made on both ſides of the ſuture, and then the evacuation cannot generally be made but on one of the ſides, becauſe the *dura mater* may ſtill remain adherent towards the edge of one of the divided bones, and retain the blood extravaſated under that bone.

VII. Obſervation by M. *Mouton*, on a ſeparation of the ſagittal ſuture.

M. *Mouton* informs us, that he was call'd to a man on the eleventh day after he had had a fall. The patient had loſt his ſenſes, and was at death's door. He examin'd his head, and only found a ſmall longitudinal tumor or elevation, the whole length of the ſagittal ſuture, where he made an inciſion about three fingers-breadths, which diſcover'd a ſeparation or diviſion of the ſuture. By means thereof a part of the blood, extravaſated under the *dura mater*, was diſcharg'd, in the night time, thro' the ſeparation of the ſuture; notwithſtanding which a fever and delirium ſucceeded next day. The trepan appear'd abſolutely neceſſary, and was accordingly applied on both ſides of the ſuture. The blood had indeed flow'd from the left ſide, but a large quantity was found under the right parietal bone, which was evacuated by this means, in conſequence of which the ſymptoms immediately abated.

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It is exceeding probable, that the *dura mater*, which always adheres ſtrongly near the ſutures, ſtuck to the bone on the right ſide, and hinder'd the diſcharge of the blood. For this reaſon, excluſively of ſymptoms, we ought to be very attentive to this circumſtance, for *Marchelis* ſpeaks of a like ſeparation of the lambdoid ſuture, which, tho' conſiderable, could not procure a diſcharge of an extravaſation on the *dura mater*, which prov'd mortal to the patient.

A ſurgeon may, in moſt caſes, eaſily determine what is to be done in wounds of the head, attended with either fracture, depreſſion, or manifeſt contuſion of the *cranium*. But there are more perplexing caſes, in which even the greateſt maſters of the art are at a loſs. Such are blows on the head without any ſenſible hurt of the bone, and often without any wound or manifeſt contuſion of the fleſh. Sometimes theſe blows produce extravaſations under the *cranium*, and at others occaſion none, tho' accompanied with circumſtances or ſymptoms which give room for ſuſpecting them. The adherence of the *pericranium*, in blows of the head, is by ſome look'd upon as a certain ſign, that there is no fracture of the *cranium*, nor any indications for the trepan. On the contrary it is judged that when this membrane is ſeparated from it, there is always a fracture or contuſion, and conſequently a neceſſity for trepanning.

They are often determined to have recourſe to this operation, by conjectures drawn from the violence of the blow, by whatever inſtrument occaſion'd. Again, if the ſymptoms, accompanying wounds of the head without fractures, be violent, this determines many ſurgeons to trepan; whereas others content themſelves with attacking the ſymptoms by bleeding, and ſuch other remedies as tend to remove them. Both parties often ſucceed, but both alſo are often deceiv'd. We ſhall therefore

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fore endeavour to discover, even in their different success, the circumstances or particulars, which may assist us in distinguishing those cases, where we may determine, with the greatest certainty, what measures are to be taken.

XIII. Observation by M. *Gallait*, on a blow of the head, with a loss of memory, cur'd without the trepan.

A man fell from an eminence of fifteen or sixteen feet high, with such force on his head, that his right eye came out of its orbit, and hung on his cheek. He was so stunn'd by the fall, that he instantly lost his senses, and continued, as it were, in a profound lethargy. A considerable contusion was found on the right parietal bone, the clavicule of the same side was fractur'd, and the eye replaced itself soon after the fall. M. *Gallait* examined the wounded part; and it did not appear that there was any extravasation under the *cranium*, nor that the flesh was separated from the bone, which inclined him to think there was no fracture. He had a mind, however, to lay the bone bare, in order to be more certain of it; but as the lethargy appear'd to him to be produced by nothing more than the commotion of the brain, and that in this case, the trepan would be useless, he placed all his hopes in bleeding, and accordingly the patient was blooded fifteen times in forty-eight hours; and the first nine times the operation was perform'd every two hours. The patient's senses did not return till the ninth day, and in a month's time the cure was compleated.

Remark on the loss of the senses, which happens immediately on a blow.

This observation seasonably brings to our remembrance a curious remark of M. *Petit*, on the loss of the senses and a lethargy, which deserves to be very attentively considered. This skilful practitioner is of opinion, that these symptoms are only the effects of a commotion of the brain, when they happen the moment the hurt is receiv'd, and that when they appear afterwards, they are caused on the con-

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contrary by an extravaſation afterwards made under the *cranium*. We ſhall not enlarge on this remark, ſince the reaſon of it is eaſily comprehended, and it is, beſides, fully explain'd in a treatiſe of operations, which M. *Petit* intends to publiſh, and we hope will appear very ſoon. We think it ſufficient to bring ſome farther examples here, which prove that the loſs of the ſenſes, which happens immediately upon receiving the hurt, is not ſufficient to determine us to apply the trepan, when there is no fracture of the *cranium*; but that, nevertheleſs, we are to conſider that the loſs of the ſenſes, cauſed by a commotion of the brain, may be follow'd by another, which depends on an extravaſation, and that both may ſometimes be confounded together.

Some authors appear to have hinted at the ſame thing, but none of them has treated ſo clearly of it as M. *Petit*, in his demonſtrations at St *Come*.

A man, of about twenty-five years of age, fell upon his head from an eminence eight or ten feet high, and receiv'd a ſmall wound on the left lateral part of the coronal. He loſt his ſenſes immediately upon the fall, and remain'd in a kind of lethargy, accompanied with a privation of almoſt all ſenſation. M. *Boudou* examining the wound, perceived that the *pericranium* was bruiſed, and dilated it, and laid the bone bare, in which he found no fracture. The patient was blooded thrice in the arm the firſt day, as often the next, and on the third he was blooded in the foot; but, notwithſtanding theſe bleedings, this accident and the lethargy continued. He made very little water, and had no ſtools. Two purgative clyſters were injected, which produced no effect. Next day ſix grains of ſome emetic were given him at two doſes, and the following day a clyſter made with an ounce of tobacco was injected; but all theſe remedies did not abate the ſymptoms. The patient remain'd in the ſame

IX. Obſervation, by M. *Boudou*, on a blow on the head, with the loſs of the ſenſes.

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ſtate till the eighth day, when he began to give proofs of the return of his ſenſes in ſome degree; for he underſtood what was ſaid, open'd his eyes, and even anſwer'd when a perſon ſpoke very loud to him, and teiz'd him. But his anſwers were incoherent, and the faint appearances of thought and knowledge diſappear'd as ſoon as he was left at reſt. The ſame evening he relapſed into his former lethargic ſtate; which was a perplexing circumſtance, and ſeem'd to be a certain ſign of an extravaſation or inflammation, or perhaps a ſuppuration under the *cranium*. Nevertheleſs, M. *Boullou*, tho' encourag'd by theſe almoſt deciſive conjectures, would not venture upon the trepan, which ſucceeds ill in hoſpitals, by reaſon of the bad air. For this reaſon he had recourſe again to purgative clyſters and the emetic, but theſe remedies availed not at all; yet, perſiſting in the ſame indication, he prefcrib'd a clyſter of tobacco, together with a purgative potion prepar'd with caſſia, which gave the patient ſeveral ſtools. At laſt he order'd him to be blooded twice in the jugular, the laſt of which bleedings was perform'd on the eighteenth day of the diſorder. Then, whether his lethargy was the conſequence of a commotion of the brain, or whether it was cauſed by an extravaſation of blood, which had been abſorb'd, this ſymptom began to diſappear, the pulſe began to diſcover itſelf, the reſpiration became more free, his underſtanding and ſenſes return'd, and in a little time the wound was quite healed. The only bad accidents which remained were deafneſs, and a total loſs of memory. But theſe ſymptoms began to abate conſiderably, at the time that this obſervation was communicated to us.

Commotion and extravaſation may, as we have ſaid, both together contribute to the loſs of the ſenſes, and the lethargy, when theſe ſymptoms continue ſeveral days.

Loſs of conſciouſneſs by extravaſation confounded with that from commotion.

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days. This caſe is very difficult to be diſtinguiſhed from that in which theſe very ſymptoms depend on commotion alone. M. *Boudou*'s obſervation, juſt related, ſeems to increaſe the difficulty, by rendering dubious a ſign, which ſhould ſeem to denote the difference between theſe two caſes with ſufficient certainty. For if the lethargy yields, at leaſt in ſome meaſure, to the bleedings and other remedies, and afterwards returns, ought we not to conclude that the firſt was cauſed by commotion, and the ſecond by the extravaſation gradually made ſince the blow; and in this view ought we not to have recourſe to the trepan? We ſee, however, by the preceding obſervation, that the ſecond lethargy was removed by repeating the bleedings and other evacuations uſed at firſt; which ſeems to aſcertain that there was no extravaſation. But ſuch ſucceſs is not very ordinary, and the indication for the trepan is in ſuch caſes too well founded to be rejected, unleſs we have particular reaſons to determine us to take another method; for it is the moſt certain and common practice, and the beſt eſtabliſh'd by experience. We proceed to give a remarkable example of it, for the ſake of young practitioners.

Loſs of the ſenſes which indicates the trepan.

A mantle-piece of a chimney, by falling all at once, ſtruck a child, of four years and an half old, on the ſuperior part of the right parietal bone, with one of its corners, and cauſed a contuſion as large as a pullet's egg. The child loſt its ſenſes the inſtant it receiv'd the hurt, and bled at the mouth.

X. Obſervation, by M. *Dru*, on a wound of the head, in which the ſagittal ſuture was taken for a fracture.

M. *Dru* found it without motion, ſenſation, pulſe, or any perceptible reſpiration. He gave him a ſpoonful of ſtrong baum-water, by which means the child vomited up the blood he had ſwallowed. Then he bled the child; the blood at firſt flowed in a ſtream, but afterwards flow'd only drop by drop.

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The ſenſes return'd a little at the end of two hours, and the pulſe grew ſtronger by ſlow degrees; and then ſome broth was given him, which he vomited up with ſome chylous matters. M. *Dru* ſuſpected a fracture of the *cranium*. M. *Guiard* a phyſician, and M. *Picard* a ſurgeon, who were call'd in at the ſame time, agreed with him that there was a neceſſity of diſcovering the bone. Accordingly he firſt made an inciſion upon the tumor, parallel to the ſagittal ſuture, and a ſecond, which, with the firſt, form'd a T. He raiſed the two angles of the wound, and perceiv'd that the contuſed fleſh was ſeparated from the *pericranium*, which adher'd to the *cranium*, and had preſerv'd its natural colour. He judged it expedient not to ſeparate it, or at leaſt to wait till next day, in order to judge better of the neceſſity or inutility of laying the bone bare. The child recover'd its ſenſes perfectly, immediately after the inciſion, and took ſome broth eaſily, but ſoon after vomited it up.

Next day M. *Dru* found him with a fever, and convulſive motions of the lower jaw. Theſe ſymptoms inclin'd him to apply the trepan; but the child's father begg'd of him to call in ſome other ſurgeons to conſult with, and four were accordingly ſent for. After the dreſſing was removed, M. *Pineau* examined the wound, and not finding the bone laid bare, was ſurpriſed that the *pericranium* was not ſeparated, becauſe he judg'd of the neceſſity of doing it, by the then ſtate of the patient. The inciſion was made from the ſide of the ſuture, in order to render it crucial, and by that means lay the bone more effectually bare, and the *pericranium* was ſeparated; but the blood that was thereby diſcharg'd, and the form of the ſagittal ſuture, which was uneven, made them take that ſuture for a fracture. The application of the trepan was put off till next day, in order the better to diſcover the ſtate of the frac-

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fracture, and the patient was blooded for the third time. Next day it appear'd that what had been taken for a fracture, was part of the ſagittal ſuture, which, inſtead of continuing its road ſtrait, ran off to the right ſide, and which likewiſe, inſtead of being indented in that part, was on the contrary ſcaly, ſo that the left parietal ran over the right about two lines. When they had perceived this kind of fault in the make of the ſagittal ſuture, and were undeceived with reſpect to the ſuppoſed fracture, it was judged proper to lay aſide the trepan.

Next day, which was the fourth of the diſorder, meſſieurs *Guiard*, the father and ſon, phyſicians, and meſſieurs *Dru* and *Picard*, ſurgeons, found the patient in a comatous diſorder, accompanied with a fever and convulſive motions, which determin'd them to the operation of the trepan, which M. *Dru* immediately perform'd; and about a tea-ſpoonful of blood, half coagulated, and of a very brown colour, was diſcharged directly from the opening made thereby. By the part where the *dura mater* adher'd to the ſagittal ſuture, a judgment was form'd how far the ſcaly part of the left parietal ran upon the right. In the evening the patient was blooded for the fourth time, and all the ſymptoms diſappear'd, and he had a good night. Next day half a ſpoonful of blood, of the ſame colour and conſiſtence with the former, came from the opening of the *cranium*; and about as much was diſcharged the ſame evening. On the ſixth and ſeventh days the matter diſcharged was mix'd, but afterwards only a laudable pus was evacuated, and the cure was happily compleated.

The indication for the trepan, tho' taken ſimply from the ſymptoms, was deciſive in this wound, becauſe the loſs of the ſenſes, which happen'd by the commotion, and that afterwards produced by the

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extravasation, appear'd separately. But sometimes the loss of the senses, produced by extravasation, happens before that occasion'd by commotion begins to disappear; in which case they are both so confounded together that we cannot distinguish them, and we may then conclude that it is always the loss of the senses produced by commotion, which continues, because sometimes it does in reality last a long time. In this confusion, the indication for the trepan is very hard to discover, when there is no fracture, and the loss of the senses is succeeded by no symptoms which can make us suspect an extravasation. We shall give an example of these two kinds of the loss of the senses, confounded together, and which were only discover'd because the surgeon was determin'd, by a fracture, to trepan the patient.

XI. Observation by M. *Pineau*, on a fracture of the *cranium*, in which there instantly happen'd a loss of the senses.

In the month of *June*, 1725, M. *Pineau* was called to see a boy of twelve years of age, whom he found deprived of his senses, and labouring under a bilious vomiting, and an involuntary discharge of his excrements and urine. A horse had just struck him on the right side of his forehead, which had depressed the two tables of the coronal bone in its inferior part, about two fingers-breadths above the superciliary sinus. The blow fell'd him to the ground as dead. M. *Pineau* order'd him to be blooded, and propos'd the trepan. But a quack having told the parents that their child could not survive the wound, and that it was to no purpose to trepan him, they left him for eight days and more in the same state, without suffering any other dressing to be applied than such as is used in a simple wound. At last, however, they left him to the care of M. *Pineau*, who made an incision, and discover'd a fracture, which was a depression of the two tables of the coronal

ronal bone, as large as a crown-piece. And next day he applied the trepan, and with the terebra extracted the portion of the depreſſed bone, and about half a pint of blood was diſcharged from the opening of the *cranium*. M. *Pineau* dreſſed the wound with a tent dipt in honey of roſes and ſpirit of wine, covering it with pledgets of dry lint, and compreſſes dipt in wine. About an hour after the operation the boy's ſenſes return'd, and the ſymptoms ceaſed. On the ſeventh day after the operation, ſomebody unadviſedly permitted him to eat ſome ſolid food, upon which ſucceeded a remitting fever, and a pain in the right *hypochondrium*. M. *Pineau* order'd him to be blooded twice, and preſcrib'd cooling clyſters to be frequently injected. The fever ceaſed, and the pain of the ſide was greatly abated in eight hours time. But the patient ſwell'd ſuddenly, from the crown of his head to the ſole of his foot. Upon which he order'd him to drink an aperient ptiſane, and purg'd him every three days with manna and epſom ſalts. This ſwelling laſted a month, but the pain was not entirely remov'd in leſs than three months, in which time the cure was finiſh'd*. M. *Garengeot* has communicated a very remarkable obſervation on the ſame ſubject.

* We may, perhaps, attribute the loſs of the ſenſes, which happen'd immediately upon receiving the blow, rather to the depreſſion of the fracture, than to the commotion of the brain. But depreſſions, which, like this, are not oppoſite to ſome ſinus which they may compreſs, do not always throw the patient into a lethargy. The blow was violent enough to cauſe a commotion capable of producing this loſs of the ſenſes, which happen'd ſo ſuddenly, that the patient dropt down as dead the moment he received it. Thus there is great reaſon to believe that the commotion was at firſt the chief cauſe of this accident. It is alſo certain, that ſo conſiderable an extravaſation, as was found in the preſent caſe, was a cauſe ſufficient to re-produce the ſame ſymptom, and maintain it in its firſt ſtate. M. *le Dran*, in the firſt volume of his obſervations, gives us the hiſtory of a blow on the head, in which we ſee, with great certainty, that there was at firſt a loſs of the ſenſes, produced by the commotion, and afterwards a lethargy, occaſioned by an extravaſation, which were ſo confounded, that, from the very moment of receiving of the wound, they ſeemed only to form one ſingle ſymptom.

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He was desired to open the body of a woman, who had receiv'd a blow of the fist upon the temporal muscle, which was immediately succeeded by a lethargy, in which state the patient lived seven days. He carefully examin'd the bone, and all the parts which cover'd it in the place where the blow was given, and found nothing but a little extravasated blood in the body of the muscle, which had insinuated itself between the fibres, but he found a considerable extravasation on the *dura mater*. This may be look'd upon as an extraordinary accident; and yet the writers of observations, and, amongst the rest, *Hippocrates*, give us some cases not much unlike it.

XII. Observation, by M. *Garengeot*, on a blow of the fist on the head, which was succeeded by an extravasation and death.

In the case communicated by M. *Pineau*, the fracture hath happily furnish'd a compleat indication for the trepan; for the loss of the senses, which happen'd immediately after the blow, and continued in the same state, would not, without the fracture, have been a sign sufficient to indicate the trepan; for tho' we can give several instances of this sort of the loss of the senses, attended with an extravasation, yet we find, by a multitude of observations, that this symptom is then almost always caused by commotion, and we even observe that this cause alone does sometimes produce, along with the loss of the senses, other very violent symptoms, in which the trepan would then be of no service.

The loss of consciousness, which happens at first, is not alone sufficient to determine us to the trepan.

A lady, of about forty years of age, fell backwards from the top of the stairs to the bottom. She was found without pulse, and senseless, and afterwards vomited a great deal of blood. M. *Manteville* examin'd her head, and only found a little redness on the hin-

XIII. Observation, by M. *Manteville*, on a blow of the head, without fracture, succeeded by considerable symptoms, and cured without the trepan.

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der and lower part of the right parietal, to which he applied compreſſes dipt in *aqua vitæ*, and blooded her ſeveral times. On the fifth day ſhe had ſome uneaſy motions, accompanied with interrupted groans, but ſtill continued ſenſeleſs. Meſſieurs *Arnauld*, *Malavil*, and *Guerin*, the father, being call'd next day, found her in violent convulſive fits, and delirious: This induced them to repeat the bleeding, notwithſtanding which the ſymptoms increaſed. Upon this, M. *Arnauld* propoſed the trepan, but the other ſurgeons were only for making an inciſion, to examine the ſtate of the *cranium*, before reſolving upon the operation. The *pericranium* adher'd to the bone, whence they preſum'd that there was no extravaſation on the brain, nor a fracture of the *cranium*. In reality they found no contuſion or other hurt of the *cranium*, at leaſt externally; for which reaſon they contented themſelves with dreſſing the wound the common way, and having recourſe again to bleeding, ſo that in nine days they took away about forty porringers of blood, and her ſenſes return'd by degrees; but ſhe was two years in recovering her health.

A loſs of the ſenſes happening at firſt, to which inconſiderable ſymptoms ſupervene, may furniſh an indication for the trepan.

Tho' ſuch conſiderable ſymptoms, ſucceeding the loſs of the ſenſes, which appear'd the moment the blow was receiv'd, were removed without the aſſiſtance of the trepan; yet, ſetting aſide, for a while, the conjectures which may be drawn from the adherence of the *pericranium*, 'tis our opinion that recourſe ought to be had to the trepan in the like caſes. For ſuch an increaſe of ſymptoms denotes likewiſe an increaſe of cauſe, and this laſt is almoſt always an extravaſation under the *cranium*, or in the internal part of the brain. The firſt is moſt frequent, and may be remedied by the trepan, and cannot be remedied ſurely but by this operation. Theſe conſiderations are ſufficient,

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it ſhould ſeem, to determine us to the trepan, when conſiderable ſymptoms ſucceed a loſs of the ſenſes happening immediately after the blow. For we ought to reaſon in theſe caſes, as in all thoſe in which the extravaſation does not otherwiſe manifeſt itſelf, than by ſymptoms which do not denote whether it is under or above the membranes of the brain, or in the internal part of that organ, and in which, however, the moſt experienced ſurgeons always determine for the trepan.

M. *le Dran*, in his obſervations, ſpeaks of a wound of the head, in which the *pericranium* was found entirely adherent to the *cranium*, as in the preceding caſe. The patient was only a little ſtunn'd when he receiv'd the blow, but ſometime after loſt his ſenſes, and was ſeiz'd with convulſive motions. Theſe ſymptoms ſtill perſiſting, notwithſtanding the bleedings, there was a conſultation of ſurgeons, wherein it was determin'd to have recourſe to the operation of the trepan, which, however, was perform'd in vain. The *cranium* was ſound, and no extravaſation found in the *dura mater*. The ſymptoms depended on a violent commotion of the brain, which prov'd mortal on the eighth day. Upon opening the head, no blood was found extravaſated on the *dura mater*, but there was extravaſated blood in ſeveral of the internal parts of the brain.

Adherence of the *pericranium* not a ſign of the ſoundneſs of the *cranium*.

We have ſeen, in the ninth obſervation, that the adherence of the *pericranium* ought not to be look'd upon as a certain ſign, that there is no extravaſation upon the *dura mater*: Neither is it a ſign of the ſoundneſs of the *cranium*. M. *Sarrau* ſaw a wound of the head with a fracture of the *cranium*, in which the *pericranium* adher'd ſo ſtrongly, even in the fractur'd part, that it was difficult

XIV. Obſervation by M. *Sarrau*, on a fracture with adherence of the *pericranium*.

ficult to ſeparate it. The adherence of the *pericranium* then is not a circumſtance ſufficient to determine us, with certainty, to reject the trepan as uſeleſs in wounds of the head.

Detachment of the *pericranium* not a certain ſign that the *cranium* is injured.

Neither is the detachment of the *pericranium* a ſign to be depended on, either to induce us to ſuſpect a fracture, or conſiderable enough to determine us to the trepan; for many obſervations evince, that this part is very often ſeparated, and yet the bone is not injur'd, and nothing dangerous happens to the patient: Of which we proceed to give ſome remarkable examples.

A boy, of about twelve years old, was ſtruck by a horſe on the coronal, juſt where the hair begins to grow, which made a wound almoſt from one temple to the other, and the bone was laid bare, the length of four finger-breadths, and the breadth of an inch. The *pericranium*, which was ſeparated from the bone, continued attach'd to the tegument, which were much torn. M. *Malaval* applied them to the bone again, and faſten'd them by ſlips of plaiſter, and a thick compreſs, which raiſed the ſkin of the forehead, and ſecur'd all by a bandage made of a handkerchief folded in a triangular form. This dreſſing anſwer'd the end of a ſuture, the wound was cured in eight days time, and no bad ſymptoms ſucceeded. He did not judge the trepan neceſſary, becauſe he was perſuaded that the blow had only glanced upon the bone, without ſtriking it violently; for he imagin'd, with reaſon, that if the horſe had ſtruck him full in the part, the bone could not have reſiſted the violence of the blow, but muſt have been fractur'd by it.

The following obſervation relates a kind of contuſion, which frequently deceives young ſurgeons. The circumference which is ſolid, and generally a little ſwell'd, and the middle which is ſoft, and forms

forms a kind of cavity in the fleſh, perceptible by preſſing the finger againſt it, makes them imagine that there is a depreſſion of the *cranium*. But when this contuſion is open'd, it is found to be blood, extravaſated between the bone and the *pericranium*, which produces this falſe appearance of depreſſion.

XV. Obſervation, by M. *Malaval*, on a contuſion, with blood extravaſated on the parietal.

A boy was ſtruck, with a ſtick, on the crown of the head, on the ſagittal ſuture, which raiſed a ſwelling as large as a hen's egg. The wound was dreſſed fifteen days unſucceſsfully with compreſſes dipt in *aqua vitæ* and the vulnerary water. And then M. *Malaval* was call'd, who concluded, from the hardneſs and fix'd circumference of this tumor, that the blood which form'd it was lodg'd under the *pericranium*. It was open'd, and the blood, tho' in ſome meaſure coagulated, ſtream'd out with force. The *cranium* was found bare the whole length of the tumor, and the *pericranium*, which was ſeparated from it, was cut thro', with the teguments to which it cloſely adher'd. He applied them to the bone again, and retain'd them in their place by compreſſes dipt in *aqua vitæ*, which he ſecur'd by the *couvrechef* bandage. He blooded the patient, and let the dreſſing lie on three days; upon taking it off he found the wound was almoſt healed, and it was entirely cured in ſix or ſeven days time.

XVI. Obſervation, by M. *Malaval*, on the ſame ſubject.

M. *Malaval* ſpeaks of a child, of five years of age, who fell upon his head, and made a contuſion, as large as an egg, on the right parietal bone; which was dreſſed, and the child blooded by M. *Ponce*, who afterwards open'd the tumor in the preſence of M. *Malaval*; it diſcharged ſome extravaſated blood, which was lodg'd under the *pericranium*, and the bone was found bare the whole length of the ſwelling, as in the preceding obſervation.

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vation. The wound was dreſſed in the ſame manner, and with the ſame ſucceſs.

We ſhall here obſerve, that theſe three obſervations of M. *Malaval* may encourage thoſe who in ſuch caſes heſitate to apply the pieces of ſeparated fleſh to the bone again, eſpecially when they are contuſed; for we ſee in theſe cures, that this practice, ſo long authoriſed by the beſt ſurgeons, has ſucceeded perfectly well, though the wounds mentioned by M. *Malaval* were made by contuſion.

Contuſed wounds cured by conſolidation.

M. *Malaval* relates another obſervation on the ſame ſubject, but more remarkable than the foregoing. A ſervant was wounded by a rough ſtone of twenty pound weight, which fell perpendicularly, from a ſecond ſtory, on the top of his head, and knock'd him down, and took away his ſenſes. The ſurgeon, who firſt ſaw him, found a large contuſion, which he immediately open'd; and finding the *pericranium* ſeparated from the *cranium*, and reflecting that the blow was a very violent one, concluded it neceſſary to trepan him; which determin'd him to cut the angles of the wound. Next day M. *Malaval* was alſo called, and upon viſiting the patient together, they found him eaſy, without a fever, and ſenſible. They perceiv'd neither fiſſure nor depreſſion of the *cranium*, and as the trepan was indicated by no ſymptom, they judged it proper to ſuſpend this operation. The patient was blooded ſix times in three days, and kept to an exact regimen, which, however, he did not obſerve long; for having found means to get to ſome apples, he eat at leaſt a thouſand from the eighth to the fortieth day of his diſorder. But, notwithſtanding this, no bad ſymptom ſucceeded. The cure took up about three months, by reaſon of the exfoliation of the uncovered bone, which retarded the healing of the wound.

XVII. Obſervation, by M. *Malaval.*

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There are few surgeons but can give us several observations of wounds of the head, in which the bone has been laid bare without being fractured, and where the trepan has not been necessary. To say the truth, these cases are so common, that it may seem needless to have treated so largely of them. But as there are some eminent surgeons, who look upon the separation of the *pericranium* as an indication for the trepan, we judged it incumbent on us not to omit those we have related. And the instances we have given are more remarkable than an infinity of others, and better calculated to convince us that the separation of the *pericranium* is not singly sufficient to determine us to the operation of the trepan.

Detachment of the *pericranium* not sufficient alone to indicate the trepan.

The force of the blow which made the wound, mention'd in the last observation, must needs render it more terrible. But because the stone made no resistance, but broke in pieces upon his head, without fracturing the external table of the *cranium*, it was therefore judged that it had not probably fractur'd the internal table; which was indeed to be fear'd, as we shall shew by the following observation.

XVIII. Observation, by M. *Soulier*, on a fracture of the second table, succeeded by symptoms which indicated the trepan.

A soldier was struck so violently with a stone, that it stunn'd him, and he dropt down, but soon came to himself again. It made two wounds, very much contused, and near to each other, on the parietal bone, to which they penetrated. M. *Soulier* made an incision which brought them into one, and order'd several bleedings, and an exact regimen. Next day, the patient walk'd in the hospital hall, and continu'd three days in this state; but on the fourth was obliged to keep his bed, and began to feel pains in all his limbs, and especially his legs, and was seiz'd with a fever.

Upon

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Upon this M. *Soulier* conſulted the phyſician of the hoſpital; and they examin'd the wounds a-new, and obſerving nothing ſuſpicious, they had recourſe again to bleeding, and dreſſed them in the ordinary method. But afterwards the wounds became fetid, and the ſymptoms continuing, the patient became as it were paralytic in the right leg and arm, a delirium with ſhiverings ſucceeded, and on the eleventh day he died.

Upon opening the body before ſeveral phyſicians and ſurgeons, about a ſpoonful of pus was found upon the *dura mater*, which was livid, and under it another ſmall abſceſs was diſcover'd, a part of the pus of which had inſinuated itſelf between the *cerebellum** and the brain. Then the *cranium* was examin'd, and nothing appear'd externally; but internally, that is, in the ſecond table, an angular fracture was found, which correſponded to the outward wound.

This obſervation is an example of a counter-blow of one table of the *cranium* on the other, which might ſerve to prove the reality of theſe ſorts of fractures, which have been conteſted, if there were not a great many inſtances of them to be met with in antient and modern authors, and amongſt the reſt in *Valeriola* and *Arcæus*. *Tulpius*† gives us an obſervation, where many fiſſures were found in the internal, without any in the external table of the *cranium*. The fracture, of which *Borelli*‖ ſpeaks, is more extraordinary. This author informs us, that a man was kill'd by a muſket charg'd with ſmall ſhot, and that tho' no fracture could be found in the firſt table, yet a portion of the ſecond was found lying upon the *dura mater*, and entirely detach'd from the firſt. *Paré*§ relates a caſe, which is no leſs aſtoniſhing: A ſoldier had

Examples of contraſiſſures.

* *La Faux* is the *French* word.
† Bonet. bibliot. chir. Tom. i. p. 2.
‖ Ibid. p. 79. § Lib. ix. cap. 8.

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had a piſtol fir'd at him, the ball of which hit his head-piece, but made only a ſlight dint therein. There was no wound to be ſeen in his head externally: He died ſix days afterwards, and being open'd, the external table was found entire, but the internal fractur'd in ſeveral pieces, which prick'd the membrane of the brain. We alſo find in authors abundance of fractures made by counter-blows from one part of the head to the oppoſite part of it; and, for the honour of the antients, we will quote the hiſtory given by *Amatus**, of a trepan applied to the part oppoſite to the wound, becauſe the ſymptoms did not yield to that applied to the ſide on which the blow was given, and becauſe the patient felt a violent pain in the oppoſite ſide. The ſecond trepan was applied very ſeaſonably, for it made way for the diſcharge of ſome pus which was lodged under the *cranium*.

This method was as ſucceſsful as could be wiſh'd, and at that time very aſtoniſhing. *Fallopius* gives us a parallel inſtance: And *Valeriola* ſpeaks of a counter-blow, ſucceeded on the twenty-third day by a gangrene, which occaſion'd the diſcovering a fracture on the ſide oppoſite to the blow, when there was no appearance of any on the ſide on which the blow was given. *Bartholin*† informs us, that, in conſequence of a wound of the head, he had ſeen an abſceſs form'd in the part oppoſite to the blow.

There are fractures by a counter-blow, not only in oppoſite parts of the head, but alſo from one bone to another contiguous bone, and from one part of a bone to the oppoſite part of the ſame bone. There are examples of this kind to be met with in authors, and, among others, in *Garengeot*§, who relates many caſes of this nature. M. *Feſte* has lately communicated one to us, which ſufficiently evinces how attentive ſurgeons ought to be to theſe counter-blows. A young

* Bonet. ſepulch. Tom. iii. de Vulner. obſ. v. † Ibid.
§ Traite d'Operations.

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XIX. Obſervation, by M. *Feſte*, on a contrafiſſure of one part of a bone to another part of the ſame bone, cured by the trepan.

A young man paſſing under a large ſhip on the ſtocks, was ſtruck upon the head by a piece of wood of fifteen pounds weight, thrown from the higheſt part of the veſſel. It fell perpendicularly on the upper part of the right parietal, and made a wound there. The patient dropt down, as if he were dead, and bled at the mouth, noſe, and right ear: And remain'd not only ſpeechleſs and ſenſeleſs, but alſo fell into convulſion fits, which laſted for ſome time, and return'd every half hour. The ſurgeon who firſt dreſſed him, in probing his wound, felt the ſagittal ſuture, which he took for a fracture. M. *Feſte*, who ſaw the patient ſoon after, ſuſpected this miſtake, and, to ſatisfy himſelf entirely about it, made a crucial inciſion large enough to lay the bone bare, upon which he effectually diſcover'd that the ſuture had been taken for a fracture. Finding neither fracture nor depreſſion in the part where the blow was given, and duly attending to the ſymptoms, which were violent, and particularly to his bleeding at one ear only, and on the ſame ſide with the wound, he ſuſpected that the force of the blow might reach the lower part of the parietal, and produce a fracture there. This well-founded ſuſpicion determin'd him to make an inciſion in that part, where he found a fracture, which extended obliquely to the occipital, and another fiſſure, which went tranſverſly towards the ſquamous ſuture; which laſt fracture was wide enough to facilitate the diſcharge of the blood, extravaſated in that part on the *dura mater*. M. *Feſte* applied two crowns of the trepan to the ſides of the oblique fracture, and preſſed the *dura mater* lightly with the *meningophylax*, to promote the diſcharge of the extravaſated blood, which iſſued plentifully from the two openings made by the trepan, and was wip'd away

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with a ſponge. The convulſive motions, which had laſted till then, immediately ceaſed, the other ſymptoms alſo diſappear'd, and the cure was happily terminated.

Thoſe who deny counter-blows, refer theſe fractures to a double blow, which the patient has either receiv'd or given himſelf, by falling down upon ſome hard body. But there are ſo many obſervations, where we ſee clearly that this double blow could not poſſibly happen, that we can no longer doubt of the reality of counter-blows. It would, however, be abſurd to deny that theſe fractures do often happen likewiſe by a double blow, and that we may even obſerve different ſorts of them in the ſame place by different blows.

XX. Obſervation, by M. *Froumontin*, on a double fracture by a double blow.

M. *Froumontin* being called to open a body, found a large wound on the left parietal, whence the ſurgeon had taken a conſiderable piece of bone, in the middle of which was a kind of hole which penetrated to the *diploe*. He alſo diſcover'd that the firſt fracture, which had detach'd the piece of bone, reach'd from one to the other parietal. The two fractures were made by different blows, and different kinds of inſtruments; the firſt by a ſharp, and the ſecond by a blunt or contuſing one, thrown upon the head of the patient, already knock'd down by the firſt. This patient liv'd twenty nine days.

Theſe obſervations ought to render us attentive to ſuch fractures, whether they happen by a counter-blow or by a double blow; for when the ſymptoms ſeem to diſcover them, we ought to take the ſureſt method, in reſpect of the trepan, as meſſieurs *Mery**, *La Motte*†, and *Le Dran*‖, have done in the like caſes.

It

* *Garengeot*, traité d'operations, tom. iii. page 122.
† Obſ. tom. ii. p. 307.
‖ Obſ. tom. ii. p. 296.

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It is alſo to be obſerv'd that, excluſively of theſe latent fractures cauſed by a counter-blow, the ſymptoms which happen ſome time after receiving the wound, as thoſe mention'd in the tenth obſervation, and thoſe ſpecified in the following, are always ſufficient to determine us to have recourſe to the trepan.

XXI. Obſervation, by M. *Marechal*, on a blow without any leſion of the *cranium*, ſucceeded by conſecutive ſymptoms which indicated the trepan.

A young man, of fifteen or ſixteen years of age, received a blow with a ſtick, on one of his parietal bones, and no bad ſymptoms ſucceeded it. M. *Marechal* contented himſelf with opening the teguments, and promoting their ſuppuration. The patient was blooded, and the wound was ſuffer'd to heal up after the ſuppuration, during which time he walk'd every day in the hoſpital-hall. When he was thought to be perfectly cured, and ready to quit the hoſpital, which was on the ſeventeenth day of the diſorder, he was ſeiz'd with a ſhivering, for which he was blooded two or three times. The ſhivering, however, return'd, and was ſucceeded by a conſiderable fever, accompanied with an head-ach, for which he was blooded again, and order'd to take vulneraries, notwithſtanding which he died on the twenty-ſecond day. M. *Marechal*, upon opening his body, found a quantity of purulent matter, as large as a pea, on the *dura mater*, on which it ſeem'd to have made no impreſſion: And he alſo affirms, that if ſuch ſymptoms had appear'd at firſt, as had occaſion'd the leaſt ſuſpicion of an extravaſation, the patient's life might have been ſaved. He might reaſonably make this acknowledgment, for when there are no ſymptoms in ſuch caſes, there are likewiſe no indications for the trepan. It is, however, probable, that if the operation had been perform'd, as ſoon as the ſymptoms that afterwards ſucceeded began to appear, the patient might have been

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been ſaved: For it muſt be particularly obſerv'd, that when the trepan comes to be indicated by ſubſequent ſymptoms, the ſucceſs principally depends upon not delaying the operation.

XXII. Obſervation, by M. *Marechal*, on a blow of the head, without leſion of the *cranium*.

A young man receiv'd a blow, with a ſtick, on one of his parietals, which was by this means laid bare. The blow was immediately ſucceeded by ſymptoms, which made it reaſonable enough to ſuſpect an extravaſation. M. *Marechal* propoſed the trepan, but, becauſe the wound ſuppurated well, and the patient's ſenſes return'd, the other ſurgeons that were conſulted did not think the ſymptoms conſiderable enough to determine them to this operation. On the ſixteenth day the patient had a fever fit, with a ſhivering, and the wound was dry, and then they agreed upon the neceſſity of the trepan. The *cranium* was no ſooner open'd than a large quantity of pus was diſcharged, which luckily had made no impreſſion on the *dura mater*, ſo that the operation was attended with the deſired ſucceſs.

This example ought to encourage ſurgeons, in ſuch caſes, always to have recourſe to the trepan, tho' the ſymptoms which may indicate it ſhould not happen till long after the perſon's receiving the wound. *Riedlinus** gives us the hiſtory of a patient who was trepan'd, with the ſame ſucceſs, three months after the blow, where the blood, extravaſated on the *dura mater*, had, in all that time, contracted no alteration. *Lambſwerde*† trepan'd a perſon at the end of ſix weeks, with the like ſucceſs. *Fabricius Hildanus*§ ſpeaks of a trepan applied two months after the blow; when a large quantity of pus was diſcharged, and at laſt there appeared a conſiderable fungus, which greatly obſtructed the cure; but it was compleated at laſt, notwithſtanding

* Ephem. an. 1700. † Obſ. 48. § Cent. 9. obſ. 3.

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ing this and a great many other inconveniences. *Marchetis** ſucceeded at the end of three months. The obſervation of *Scultetus*† is ſtill more remarkable; for tho' the operation was not perform'd till ſix months after the blow had been receiv'd, yet it ſucceeded extremely well.

Theſe caſes would be truly ſurpriſing, if the ſymptoms which indicate the trepan, and happen ſo late, depended upon an extravaſation of blood under the *cranium*; but they are leſs aſtoniſhing when they depend on a ſuppuration; for we know that a ſuppuration may not happen, nor diſcover itſelf, till a long time after the receiving of the blow.

It is evident, from all theſe obſervations, that it is only the ſymptoms that can determine us to have recourſe to the trepan, in blows of the head without any apparent hurt of the *cranium*. For the conjectures that may be drawn from the force of the blow, the ſituation of the wound, and the ſtate of the *pericranium*‖, *&c.* cannot alone conſtitute a ſufficient indication for this operation; and we ſhould act wrong, in being influenced by ſuch ſigns, not to trepan, if theſe wounds were immediately accompanied with conſiderable ſymptoms; ſuch as the loſs of the ſenſes, which happens in conſequence of the blow, and that

RESULT. In blows without fracture, the ſymptoms may alone determine to the trepan, eſpecially the ſubſequent ſymptoms.

* Obſ. 7. † Arcen. obſ. 13.

‖ We have not yet ſpoken of the *ecchymoſes* of the eyes, of the vomiting, and of the blood diſcharg'd from the noſe, eyes, ears, and mouth, becauſe the uncertainty of theſe ſigns has already been obſerv'd by moſt obſervers. Sometimes theſe ſymptoms appear in caſes, where there is either a fracture or an extravaſation, and at others in thoſe where there is neither. They are even often accompanied, in theſe laſt caſes, with the loſs of the ſenſes, and ſometimes with convulſive motions, &c. M. *La Motte*, among others, relates ſeveral examples of theſe different caſes, in his obſervations, page 242, 266, 274, 303, 333, 340, 346, 363, and 364.

Conjectures taken from vomiting and the diſcharge of blood from the noſe, eyes, ears and mouth, do not indicate the trepan.

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which happens immediately on receiving it*; and is

* Surgeons are neither agreed among themſelves, nor in their own minds, about the loſs of the ſenſes, which happens the moment the blow is received. This contradiction is very remarkable in the writers of obſervations. For inſtance, *Marchetis*, in his medico-chirurgical obſervations, page 12. blames his fellow ſurgeons for not conſenting to the operation of the trepan, which he propoſed in a loſs of the ſenſes, which happen'd immediately on a blow on the head, and was ſucceeded by a ſuppuration under the *cranium*, which killed the patient. "A wooden window," ſays he, "of a conſiderable weight fell "from a great height on the *bregma* of a young man, which was not by this "means cut but greatly contuſed. In conſequence of this, the patient fell "to the ground, where he remain'd without ſenſe and motion, and deprived "of all his principal faculties for the ſpace of an hour. A phyſician of great "note, and a ſurgeon being called, the uſual remedies were immediately ap-"plied, namely, the white of an egg, oil of roſes, and the like. But I being "called on the ſecond day, judged that the operation of the trepan ought to "be immediately perform'd, contrary to the ſentiments of ſome ſurgeons, "my ſeniors, and the patient's father. But being called in again after the "twentieth day, with the conſent of them all, I made a crucial inciſion, from "which a large quantity of pus was diſcharged An ounce of matter flow'd "daily thro' the pores of the *cranium*; for which reaſon, when I had perfo-"rated it, a large quantity of pus flow'd from the opening every day, but "the patient died on the ſixtieth day. I mention this, that you may not "fall into the like errors, when you have ſuch wounded perſons to treat, as "have ſymptoms denoting that the internal parts are injured." *Marchetis* relates this fact as a kind of victory, which he obtain'd over his fellow-ſurgeons. Many animadverſions might be made on this oſtentatious boaſting, which is but too common amongſt the writers of obſervations, and is generally ill-founded. In the preſent caſe, for inſtance, it is only by the event that *Marchetis* ſupports himſelf. But a ſuppuration, which happens after a blow on the head, does not prove the immediate neceſſity of trepanning. A ſuppuration, eſpecially of the purulent kind, is not always the conſequence of an extravaſation; for it is often no more than the effect of an inflammation occaſioned by commotion; and in this caſe, the ſymptoms of the commotion, and even the loſs of the ſenſes, do not always happen the inſtant the blow is received; and ſometimes not till a conſiderable time afterwards. *Marchetis* determin'd for the operation, the firſt day of the accident, from the ſymptoms, and theſe were now reduced to a loſs of the ſenſes, which happen'd immediately after the blow, and laſted but an hour. But ſome pages after, in *obſ.* 15, he maintains, that the loſs of the ſenſes is not ſingly ſufficient in ſuch caſes to induce us to trepan. "In ſuch wounds of the head," ſays he, "ſome things are to "be obſerv'd; for if by any blow or fall the patient's ſenſes are taken away, "and he is deprived of ſenſation and motion, there is no danger, unleſs the "other ſymptoms, enumerated by *Hippocrates*, ſucceed; and in this caſe we "are to forbear all operations, ſuch as inciſion, and the application of the tre-"pan; for I have ſeen ſome whoſe heads were wounded by a blow or fall, "accompanied only with this ſymptom, totally recover'd and cured next day."

Contradictions of authors with reſpect to the loſs of conſciouſneſs, which happens immediately after the blow.

M. *La Motte* has ſome obſervations,* where we ſee, that, happily for the patient, he uſed the trepan in a loſs of the ſenſes which happen'd immediately on a blow; and in ſome caſes, which were accompanied with vomiting, and a diſcharge of blood from the noſe, ears, eyes, and mouth, and ſometimes with convulſive motions. The ſame author relates other examples† of blows of the head, immediately ſucceeded by a loſs of the ſenſes, attended with the ſame ſymptoms, and of which the patients were perfectly cured without the trepan. Theſe contradictory facts in which ſurgeons can hardly

Obſervators often fail to mention the indications by which they ought to have regulated their conduct.

* Tom. ii. p. 302, 333, 340, 346. † Ib. p. 242, 266, 274, 363, 364.

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is accompanied with other ſymptoms; ſuch as convulſive motions, a palſy, a violent fever, and diſorder'd pulſe; and eſpecially if theſe ſymptoms ſhould continue notwithſtanding the repeated bleeding, and the other remedies which may be uſed to remove them. It is to be obſerv'd that the bleedings ought to be very copious, and perform'd as ſoon as poſſible, in order to prevent the extravaſation; for they cannot be of any great uſe when the extravaſation is made, eſpecially when it is conſiderable.

We ought to be very attentive to the ſymptoms which ſucceed the loſs of the ſenſes, that happens immediately on receiving the blow; for, as we have obſerv'd, this often conceals an extravaſation, and unleſs we never fail to trepan in this caſe, that is to ſay, to trepan for the moſt part in vain, we muſt be at a loſs, when there is no other ſymptom but this, what method to take, with reſpect to the extravaſation, which may attend, and occaſion this loſs of the ſenſes. All our dependance in this laſt caſe is founded on the ſymptoms which ſuch an extravaſation will not fail to produce afterwards; for then theſe ſymptoms inſtruct the ſurgeon, and induce him to perform an operation which may preſerve the life of the patient. Thus, tho' the loſs of the ſenſes alone is no deciſive argument for the trepan, yet the patient, in caſe there be extravaſated blood, is not entirely expoſed to the fatal conſequences of ſuch an extravaſation, if the ſur-

We ought to be very attentive to conſecutive ſymptoms.

hardly tell what they ought to have done, till after the affair is over, and only from the event, do not each of them in particular determine any thing with reſpect to practice, and neither inſtruct the ſurgeons themſelves, nor thoſe that would follow them. The hiſtories of thoſe cures, where the ſurgeons ſeem to have proceeded only by chance (that is, when they ſay nothing of the indications which they ought to have taken, and regulated themſelves by, in thoſe caſes which appear ſo much alike, and in which they had recourſe to ſuch oppoſite methods, and notwithſtanding had the ſame ſucceſs) are not practical obſervations, but mere hiſtories of cures, ſuch as thoſe who only ſaw them might give, tho' they were neither phyſicians nor ſurgeons.

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geon be attentive to the ſymptoms, and thoroughly knows what method is beſt to be taken. Theſe conjectures ought to be ſtill leſs minded in caſes where there have been no original or primary ſymptoms, and very conſiderable ones happen afterwards, ſuch as ſhiverings, a fever, a delirium, a fix'd and acute internal pain, a lethargy, and convulſive motions; for in this caſe the patient muſt die, if he be not trepan'd with the utmoſt expedition, and even before theſe ſymptoms denote extreme danger.

Conjectures may aſſiſt us to determine in difficult caſes.

We do not, however, aſſert that theſe conjectures are quite uſeleſs, in determining us how to act in perplexing caſes; they may, if they are favourable, contribute to encourage us when there are no terrible ſymptoms, or to aſſiſt us, if otherwiſe, in determining for the operation, eſpecially in caſes already attended with ſome ſymptoms which ſeem to indicate it. But we maintain that they ought not ſingly to be admitted for deciſive ſigns, to trepan, or not to trepan; for we can determine nothing concerning the ſtate of the *pericranium*, if, as we have obſerv'd, it may be detach'd and contuſed, and no bad ſymptoms ſucceed, and if it may continue to adhere to the *cranium*, and appear in its natural ſtate, tho' there is a fracture or extravaſation. Neither can we come to any determination concerning the inſtrument by which a wound is given; if a blow of the fiſt cauſes a mortal extravaſation, and if the fall of a rough ſtone, of twenty pounds weight, perpendicularly from a great height, on the head, makes a large wound in it, without occaſioning any bad ſymptoms, we ſhould find the ſame uncertainty every where, if we were to enter into an examination of theſe conjectures.

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We muſt not, however, forget to obſerve that it would be wrong to entertain the ſame notions of the conjectures, with reſpect to the trepan, derivable from gun-ſhot wounds of the head, as we do from thoſe which may be drawn from the blows given by other inſtruments which act with leſs violence; for moſt of the eminent ſurgeons aſſert, that we ought always to trepan in gun-ſhot wounds of the head, even tho' the *cranium* is not fractured; and, indeed, experience ſeems intirely to confirm their opinion.

Wounds of the head, made by fire-arms, merit particular attention.

A ſoldier received a wound, by a muſket-ball, on the right parietal bone: The blow neither threw him down, nor was ſucceeded by any ſymptom. M. *La Combe*, who inſpected the wound, found the bone laid bare, but no way hurt, for which reaſon he did not think the trepan neceſſary. On the twentieth day he perceived that the bone became black, and look'd upon this change as a preparation for exfoliation. But on the thirty-fifth day he was ſurpriſed at what happen'd; for a piece of bone, of the whole thickneſs of the *cranium*, came away, and made way for the diſcharge of half a glaſs full of pretty laudable pus, which had been lodg'd between the *cranium* and *dura mater*. He treated the patient, as if he had been trepan'd. The *dura mater* was deterg'd in a few days, the opening of the *cranium* was quickly fill'd up, and the cure completed in two months. It ſeems difficult enough to comprehend how ſo large a quantity of pus could be generated, and lodg'd on the *dura mater*, without occaſioning any ſymptoms during the whole courſe of the cure. This will, however, appear leſs ſurpriſing, if we attend to a vaſt number of examples, which ſhew that pus is often inſenſibly form'd on the *dura mater*, in wounds of the

XXIII. Obſervation, by M. *La Combe*, on a wound of the head by a muſket ball, which render'd the trepan neceſſary.

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the head, and that we are only appriſed of it by the ſymptoms produced by this matter, which afterwards becomes acrimonious by its ſtay there, and irritates the *dura mater*. And 'tis reaſonable to conclude, that theſe ſymptoms would not have failed to appear, if the kind of exfoliation which happen'd, had not procured the evacuation of the pus before a longer ſtay had render'd it noxious. We find in this obſervation, that tho' the blow cauſed no commotion, nor other remarkable ſymptom, yet the ball produced ſo violent a contuſion in the *cranium*, that it intirely deſtroy'd that part of the bone againſt which it ſtruck, and occaſion'd a conſiderable ſuppuration. Hence we may conclude, that fire-arms act with ſuch violence, as muſt needs render them very dreadful. For tho' they cauſe no fracture nor viſible contuſion in the *cranium*, and tho' no conſiderable ſymptom ſucceeds, yet even ſuch as are made by balls that are almoſt ſpent, deſerve particular attention, becauſe they may produce fatal conſequences.

XXIV. Obſervation, by M. *Martiniere*, on a gun-ſhot wound, without hurt to the *cranium*.

A lieutenant, of the regiment of *Hainault*, received a wound, by a ball that had almoſt loſt its force, a little above the right frontal ſinus. The ſurgeon, who firſt ſaw it, judg'd it proper to make a crucial inciſion to examine the bone, but found no fracture. The blow had ſomewhat ſtunn'd the patient, but bleeding remov'd this ſymptom, and of courſe he had nothing more in view than the cure of the wound. At three weeks end the patient fell into a lethargy, and his pulſe became low and hard. M. *Petit* the ſon, and M. *Martiniere*, chief ſurgeons to the army, being ſent for, found the patient paſt hopes of recovery. However, the trepan ſeem'd to be ſo ſtrongly indicated, that they thought themſelves obliged to have recourſe to it. And this operation let out abundance

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bundance of pus, which was lodg'd under the *cranium*, but being perform'd only in the last extremity, it was of no service to the patient. These examples sufficiently shew that gun-shot wounds ought not to be confounded with other wounds of the head, where the conjectures which may be drawn from the wounding instrument, and the apparent force of the blow, lead to no determination.

We must have a very different opinion of wounds of the head, made by cutting and pungent instruments; for these wounds may not only not occasion extravasations, when they don't injure the *cranium*, but even when these instruments do make incisions or punctures therein; for which reason young surgeons ought carefully to distinguish these incisions from other wounds of the *cranium* by contusing instruments. But notwithstanding it sometimes happens, that cutting or pungent instruments not only make simple incisions or punctures, but also produce fractures or contusions, and even depressions of the *cranium*; so that the surgeon ought to examine diligently if the wounds which these instruments make in the *cranium*, are only simple incisions, or slight punctures, or if they are partly fractures or contusions, and partly incisions or punctures. A fracture may generally be distinguished from an incision, by inspecting the wounded part: But to judge of a contusion, it is good to know, if possible, what sort of edge or point the instrument has which made the wound; for when incisions or punctures of the *cranium* are made by blunt instruments, we are to look upon them as contusing at the same time, especially when they are very large; whereas, when they are light, and have a fine edge, or are very sharp-pointed, we may presume that the incisions or punctures are without contusion; or that, if there is any, it is a very slight one; and then

Lesions of the *cranium*, caused by cutting or pungent instruments, do not always indicate the trepan.

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then they are not much to be apprehended. *Paré* did not heſitate, in a parallel caſe, to replace a portion of the bone, which was intirely ſeparated from the *cranium*, by the ſtroke of a ſabre, and which remained attached to the fleſh, and this practical expedient ſucceeded perfectly well.

Sound of a ſplit veſſel, obſerv'd by the patient or ſurgeon, merits attention.

Laſtly, we ought carefully to attend to a circumſtance, which ſometimes accompanies wounds of the head, which is, the ſenſation, as it were, of the ſound of a crack'd veſſel, which may be heard in ſome caſes when the bone is ſtruck, and which the patient likewiſe ſometimes perceives upon receiving the blow. This circumſtance, and the conjectures it affords, with reſpect to the trepan, are no contemptible ones, eſpecially when the patient aſſures us, that this ſound was very diſtinct and obſervable to him, and the blow likewiſe was a violent one; for in this caſe, if we find no external hurt of the *cranium*, there is reaſon to ſuſpect its internal table is fractur'd. M. *La Motte*, in a like caſe, perform'd the operation*, and found a fracture in the internal table of the *cranium*, and a conſiderable extravaſation on the *dura mater*.

The ſymptoms which happen long after the blow, are the moſt preſſing for the trepan.

It would be wrong to make the ſame inferences from the ſymptoms which come on after the blow, as we do from moſt of the conjectures we have mention'd; for theſe ſymptoms generally indicate the trepan when they are conſiderable, and the later they happen after the blow the more urgent they are. And the like ſymptoms ſuffice, excluſively of theſe conjectures, whether good or bad, to determine a ſurgeon to trepan. Theſe ſymptoms, indeed, ſometimes depend on internal cauſes, which are mortal, and in which the trepan is of no effect: Such are, for inſtance, a gangrene, a ſuppuration, or an extra-

* Obſ. de chir. tom. ii. p. 303.

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extravaſation in the brain. Yet under this uncertainty, we ought ſtill to have recourſe to this operation, as it is the only remedy we can try in ſuch a caſe to ſave the patient; and our hope is the better founded, inaſmuch as theſe cauſes are much oftener lodg'd between the *cranium* and the brain, than within that organ. Thus, tho', in a parallel caſe, the ſucceſs is in ſome meaſure dubious, yet the indication is neither equivocal, nor the art leſs certain in its deciſions, becauſe, on ſuch occaſions, the ſurgeon manifeſtly determines to take the moſt likely method to ſucceed, and that which is beſt authoriſed by experience.

I can't conceive that, after entering into the particular circumſtances of the different caſes I have examin'd, it can be objected to me, that patients have been cured without the trepan, though their wounds have been ſucceeded by full as bad ſymptoms as thoſe which have determin'd ſurgeons to trepan other patients, where the operation was abſolutely neceſſary: For we ought to form the ſame judgment of the ſymptoms capable of determining us to trepan, as we do of fractures and depreſſions of the *cranium*, which determine the moſt ſkilful and experienced ſurgeons to perform this operation, tho' theſe accidents are not infallible ſigns of the indiſpenſable neceſſity of applying the trepan, ſince we have a great many examples of fractures and depreſſions of the *cranium* cured without it. The precepts of the art are not ſhaken by ſome particular obſervations, if, upon comparing all the circumſtances, it appears that they preſcribe the ſureſt and ſafeſt method.

XXV. Obſervation, by M. *Mantevile*, on a blow of the head, ſucceeded by terrible ſymptoms which depended on the *pericranium*.

But before determining to apply the trepan, even from the moſt conſiderable ſymptoms, it is of moment to be well aſſured, whether theſe do not depend on the ſtate of the external

wound,

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wound, eſpecially of the *pericranium*, which often happens. An example will be ſufficient to evince the neceſſity and wiſdom of this precaution: A man, of about ſixty years of age, was thrown down in the ſtreet by a coach, and by this means received a contuſed wound, about two finger-breadths long, on the ſuperior and lateral part of the fore-head near the coronal ſuture. On the ſeventh day he was ſeiz'd with a gentle head-ach, accompanied with a ſlight fever, which increaſed next day; and the fleſh of the wound became pale. On the ninth day the patient was lethargic, the tenth began to rave, and a total delirium ſucceeded. M. *Manteville* bled him ſeveral times, to abate theſe ſymptoms. At laſt he reſolved to relax the *pericranium*, by making an inciſion in it to the bone; imagining that the ſymptoms might depend on this part, which was irritated and inflam'd, and in reality the inciſion removed them. To the tenſion of the *pericranium* and theſe ſymptoms there ſometimes ſucceeds an eryſipelatous ſwelling of the whole head: In which caſe an experienced ſurgeon eaſily diſcovers the ſource of the diſorder, and ſpeedily relieves it by the ſame operation. But in moſt caſes, we ought, firſt (as M. *Manteville* did) to try what effect repeated bleeding will have, which was almoſt the ſingle refuge of the antients in ſuch caſes. The operation here perform'd, to give the *pericranium* liberty, was little known before *Pigray*. *Parè** remov'd the like ſymptoms by taking twenty-ſeven porringers of blood from the patient, which is about nine bleedings, and it was thought a large quantity in his time.

CASE

* Lib. ix. cap. 14.

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CASE II.

IT ſometimes happens, after blows on the head, that there remains a fix'd pain in the wounded part after the cure, which, inſtead of abating, in time increaſes more and more, notwithſtanding all the topics that can be applied, which hath often oblig'd the ſurgeon to make an incifion to lay the bone bare. Some ſurgeons have choſe to raſp the bone, others to wait for its exfoliation, and others have judg'd it expedient to proceed to the trepan; and we ſhall find, by the following obſervations, that theſe methods have ſucceeded differently, according to the ſeveral caſes in which they were uſed.

Pains of the head after a blow.

A girl, of ten or twelve years of age, received a blow upon her head, by the fall of a curtain-rod upon it, which, however, made no wound, and ſhe was ſoon cured; except only that ſhe had a fix'd pain, of little compaſs, on one of her parietal bones; which increaſed now and then ſo much as to produce a fever, which was abated by repeated bleedings, and other general remedies. But the pain continuing obſtinate for ſome years, M. *Marechal* was called, and judged the trepan neceſſary. He laid that part of the bone bare, where the pain was felt, and applying the trepan found the ſawduſt of the bone dry, like that of a *cranium* which has been long buried. This operation ſucceeded ſo well, that the pain ceaſed intirely, and never returned. M. *Morel*, in the following obſervation, gives us two examples of the like ſucceſs.

XXVI. Obſervation, by M. *Marechal*, on a long continued pain in the head, after a blow, cured by the trepan.

A certain lady received a blow, by a log of wood, upon the middle part of the left parietal bone; which made

XXVII. Obſervation, by M. *Morel*, on the ſame ſubject.

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no wound, nor viſible contuſion. She was blooded, and a ſlight tho' fix'd pain in the wounded part engaged her to apply various remedies, and repeat the bleedings ſeveral times, all which gave her no relief, but the pain increaſed more and more. Upon this M. *Morel* judged it proper to open the temporal artery, which reliev'd her for about a month, but the pain return'd. A ſanious humour flow'd from the ear of the wounded ſide, and afterwards from the other ear; but theſe diſcharges did not diminiſh the pain, which became more violent, tho' they return'd periodically every month, for the ſpace of a year, by turns affecting one ear and then the other.

XXVIII. Obſervation, by M. *Morel*, on the ſame ſubject.

The patient, tir'd of her pain, called a conſultation, in which it was reſolv'd to open the part where ſhe felt the pain. The bone was found, which made it hop'd that the ſuppuration would contribute to cure the diſorder; it laſted fifteen days, but without producing the expected effect. M. *Morel* imagined the trepan might be attended with better ſucceſs, and was induced to think ſo, becauſe, ſome years before, he had ſeen a ſervant maid who had received a blow on the head, which did not ſeem to require the trepan, tho' ſome ſymptoms, which continued and prov'd obſtinate, determin'd the ſurgeon to have recourſe to the operation, ſix months after ſhe had receiv'd the blow; which was attended with ſuch ſucceſs, that M. *Morel*, taught by this example, propoſed the ſame operation for this lady, and perform'd it with the ſame ſucceſs. Nothing was found under the *cranium*, nevertheleſs the pain went quite off.

XXIX. Obſervation, by M. *Vacher*, on a pain of the head, ariſing from an internal cauſe, in which the trepan was uſeleſs.

M. *Vacher*, who was a witneſs of this cure, had recourſe to the ſame remedy in a parallel caſe, but not with the ſame benefit, becauſe the diſorder, as we ſhall ſee, did not ariſe from the ſame cauſe.

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The daughter of an innkeeper in *Beſançon* was attack'd with a pain of the head, which at firſt was not violent, but increaſed ſo in two months time, that ſhe was oblig'd to apply to a phyſician, who; for the firſt ſix years of her diſorder, in vain exhauſted all the reſources of his art. At length M. *Vacher* being call'd, thought of arteriotomy, which did little ſervice. The patient, upon this, applied to another ſurgeon, who by his promiſes had gain'd her confidence. He made a crucial inciſion upon the middle of the ſagittal ſuture, and raſp'd the bone, without any regard to the ſuture. But finding that the patient reap'd no benefit from this method, he cur'd the wound, and took his leave of her: Then the girl ſent for another ſurgeon, who deſired a conſultation, and accordingly M. *Vacher*, and ſeveral phyſicians and ſurgeons were call'd. M. *Vacher* relying on the ſucceſs of the trepan, in the preceding caſes, propoſed that operation; and the reſt agreed to his opinion. The operation was perform'd, and no extravaſation was found on the *dura mater*, nor any change in that membrane, only it appear'd ſomewhat more tenſe than in its natural ſtate, which induced M. *Vacher*, ſome days after the operation, which had given no relief, to make a ſmall opening in it, which prov'd of no ſervice as well as the trepan; for the pain not only continued, but by intervals became extremely violent. On the eighth day after the operation death put an end to it, after the patient had endur'd it eight years.

Cranium raſp'd upon a future without ſymptoms.

Upon opening the *cranium*, three fungous excreſcences were found, the largeſt of which was as big as a pea. They aroſe from the cortical ſubſtance of the brain, and adher'd to the *dura mater*, which, in that part, was very thick; whilſt, on the contrary, the bone oppoſite to them was no thicker than a piece of paper. The ſuperior ventricles were full

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of water, and the third was full of thick black blood. In the *plexus choroides* were found about twenty glands, of the figure and ſize of the ſeeds of broom; at laſt an ulcer was diſcover'd on the ſurface of the *cerebellum*, which penetrated three lines deep into its ſubſtance. It is ſufficiently obvious, from this detail, that the trepan could do no ſervice in this diſorder, which, as it did not ariſe from an external cauſe, of courſe does not belong to our ſubject. The following obſervation brings us back to it, and evinces that there are fix'd pains, which, tho' they proceed from external cauſes, do not require the trepan.

XXX Obſervation, by M. *Gervais*, on a long pain after a blow, cured by an exfoliation of the *cranium*.

A girl, of fourteen or fifteen years of age, fell backwards in coming down ſtairs, by which means ſhe loſt her ſenſes, and bled at the noſe. She had a violent head-ach, which laſted many days, and was blooded ſeveral times for it, both in the arm and foot. Theſe bleedings reliev'd her much: But, notwithſtanding, there remained a fix'd pain in the back of her head, which was tolerable for the firſt fifteen days, but afterwards increaſed conſiderably, and return'd at regular periods. When ſhe rubb'd the back of her head a little, ſhe fainted away; and, excluſively of this ſymptom, ſhe had epileptic fits eight or ten times a day after her pain grew ſo violent. M. *Gervais*, upon examining the part where ſhe felt the pain, obſerv'd a ſmall blackiſh ſpot in the ſkin, on the middle and ſuperior part of the occipital bone. The ſkin was ſofter in this than in the neighbouring parts, and even look'd as if it were bruiſed. He preſſed the part pretty hard with his finger, upon which the patient fainted away; not imagining at firſt that this accident was occaſion'd by the preſſure, as ſoon as ſhe came to herſelf he began to preſs the ſame part again, to try whether he could find any diſorder of the bones, upon

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upon which ſhe fainted away a ſecond time. Then he began to ſuſpect that he had occaſioned this ſyncope, and for farther ſatisfaction preſſed the ſame part a third and fourth time, and each time the ſame accident happen'd. All endeavours to cure this girl by applications were fruitleſs; ſo that at laſt it was determin'd, in a conſultation, to lay the pained part bare. The *pericranium* was ſeparated from the bone, and the bone carious. As the ſymptoms continued after laying the bone bare, M. *Gervais* heſitated about applying the trepan, but believ'd that he might omit it, upon a preſumption that exfoliation would be ſufficient. Accordingly, as ſoon as the piece of carious bone was exfoliated, all the ſymptoms ceaſed, and return'd no more. *Scultetus* * relates an almoſt ſimilar cure: A boy, about ſeven years old, fell down and pitch'd upon his head, and made a contuſion on the ſide of the ſinciput, which was ſucceeded by pain and convulſions; which, he adds, were immediately abated by applying the ſkin of a lamb newly flay'd to the child's head. But the pain and convulſions return'd regularly every new moon, which oblig'd *Scultetus* to open the wounded part, four months after the fall, ſuſpecting that ſome humour was lodg'd between the *pericranium* and the bone, which corroded theſe parts. He found the *cranium* black and rough; the carious part was raſp'd, after which it was cover'd with good fleſh, and the child perfectly cured in a ſhort time. *Foreſtus* † relates an obſervation of the ſame kind; tho' it was ſome years after a wound of the head, before it was thought expedient to lay the bone bare, in order to cure a violent and fix'd pain, which had continued from the time of the accident, and ceaſed upon this operation.

* Armament. chirurg. obſ. 16.
† Bonet. biblioth. chir. obſerv. de *Foreſtus*, obſ. 79.

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*Marchetis** ſpeaks of a wound of the head, which, after being cured, was ſucceeded by epileptic fits, and afterwards cured by the trepan. We ſhall hereafter relate an obſervation of M. *Turſan*, junior, of an epileptic patient, who received a blow on the head, for which he was trepan'd. The patient had no fit of the epilepſy ſo long as his wound was open, but it return'd as ſoon as the wound was cured. There are abundance of obſervations, to be found in authors, relating to the ſucceſs of this operation, in the epilepſy in general. But as we conſider the trepan here only, with reſpect to wounds of the head, we ſhall take another opportunity of producing theſe obſervations. However, it may not be amiſs to mention a fact, in reſpect of the trepan, which ſeems a little foreign to our ſubject, becauſe it is not certain that the diſorder was occaſion'd by a blow on the head; but 'tis certain that a blow on the head may be attended with the ſame accidents.

A nun, of the *Hotel Dieu* of *Mantes*, was ſeiz'd with a violent pain in the top of her head, accompanied with a conſiderable fever, and other dangerous ſymptoms; whence a ſuppuration was ſuſpected in the pained part. This ſuſpicion, along with the dangerous ſtate of the patient, made her ſurgeons undertake to trepan her; which preſerv'd her life, by giving vent to a conſiderable abſceſs form'd under the *cranium*. I have been ſurgeon of the ſame hoſpital ſince, where I ſaw and examin'd this nun, and the ſurgeons who were preſent at the operation. When we come to treat of the multiplicity of trepans, we ſhall relate an obſervation of M. *Daviel* of a pain of the head, produced by a caries, which did not yield to the trepan, but only to an exfoliation which afterwards happened.

We

* Obſerv. medico-chirurg. obſ. 7.

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We ſee, by theſe obſervations, that the ſame end has been attain'd by different methods; to which, however, we are not to have recourſe without diſtinction; for they ſufficiently evince, that the trepan ought not to be apply'd, except the bone is carious almoſt in its whole thickneſs, or there are any ſymptoms which make it probable that the cauſe of the diſorder is under the *cranium*, like that *caries* mention'd by *Bartholin*, in the internal ſurface of the parietal bones; or, laſtly, if, after having judg'd it proper to wait for exfoliation, this does not remove the ſymptoms. But when the pain is external, and increaſed by any preſſure on the part, all our hopes are from exfoliation, eſpecially, if, after having laid the bone bare, only a ſuperficial caries appears. To be aſſur'd of this, we muſt have recourſe to the *rugine*, the uſe of which, in ſuch caſes, may be attended with other advantages, ſuch as greatly promoting the exfoliation, and removing the pain before that happens. But this laſt effect depends principally upon laying the whole ſurface of the carious bone quite bare, that the caries may communicate no further with any part of the *pericranium*.

RESULT. The trepan is neceſſary when the cauſe of the pain is internal, but exfoliation is ſufficient when it is external.

A Remark *on the Utility of* Obſervations.

WE ſhall take this opportunity, which the preſent ſubject affords us, of making an important remark on the utility of obſervations. The manifeſt contrarieties in thoſe we have related, may ſuffice to ſhew how dangerous it is to regulate ourſelves in practice by the obſervations of others, when we look on every ſingle obſervation as a model, and only conſider the ſucceſs; conceive too highly of the reputation of their authors, and have not ourſelves obſerv'd the ſingularities, variations, or

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uncertainty perceivable in the exerciſe of the art; or have not ſkill enough to diſcover the particular cauſes of all theſe varieties in the obſervations of others. Can a young ſurgeon, for inſtance, from the twelfth and twenty-firſt obſervations, determine himſelf, in a ſimilar caſe, to trepan or not to trepan? They were attended, in the beginning, with ſymptoms which divided the phyſicians and ſurgeons. In the twelfth, we find, that thoſe who propoſed the trepan were in the wrong. In the twenty-firſt 'tis plain that thoſe who adviſed it were right in their opinion. But in both caſes, nothing but the event removed the uncertainty, with reſpect to the method to be taken. That which was choſen, cannot ſerve as an example, ſince the ſucceſs was ſo different in theſe two cures. From the tenth and fourteenth obſervations it further appears, that there are caſes wherein we ſhould riſque the patient's life for want of the trepan, if, on account of the adherence of the *pericranium*, we ſhould aſcribe the ſymptoms, as in the thirteenth obſervation, to a commotion of the brain, and for that reaſon think the trepan uſeleſs. The ſame danger might be apprehended, if a young ſurgeon ſhould take the ſecond for a guide, in ſuch a ſeparation of a future, as that related in the ſeventh. Would it not alſo be dangerous, if a ſurgeon were to be guided by the twenty-fifth, in caſes reſembling that mention'd in the twenty-ninth, ſince by ſo doing he would uſe the trepan very improperly? In a word, would it not be an egregious fault to follow the twenty-ninth, in caſes like thoſe related in the twenty-ſixth and twenty-ſeventh obſervations, ſince we ſhould loſe the patient by neglecting to have recourſe to the trepan? Theſe examples are ſufficient to demonſtrate how important it is to caution young ſurgeons, not to attach themſelves to particular obſervations, and eſpe-

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eſpecially not to look upon them as models propoſed to them to form their practice by.

Yet we are thoroughly convinced, that nothing is more uſeful than obſervations to inſtruct young ſurgeons; for it is eaſily perceiv'd that the niceſt and moſt difficult principles of the art are render'd obvious, and brought down to the level of the generality, by nothing but ſtriking examples. We only aſſert that it is impoſſible to reap this advantage from ſingle and detach'd obſervations: For theſe ought only to be look'd upon as the materials neceſſary to build firmly, or, in other words, to form a ſure, exact, and eaſily comprehenſible doctrine. Now it is evident, from the different examples we have related in the firſt article of this eſſay, that the collecting a great number of obſervations, comparing them together, and oppoſing them to each other, is the only way to prevent our being led into miſtakes thereby; and when they contain oppoſite methods, which ſeem to contradict each other, and render us at a loſs what choice to make, nothing but this can hinder our being impoſed upon by ſpecious cures, which favour falſe or hazardous methods of practice. By this procedure only, we are enabled to diſcover certain ſingularities in the moſt common and moſt erroneous obſervations, which may aſſiſt us in diſcovering or illuſtrating ſome truths of great importance, either to theory or practice: Again, by this cautious method, after making an accurate examination of ſuch obſervations, as ſeem to relate to the ſame caſe, we may obſerve the particularities and circumſtances, which enable us to diſcover certain eſſential differences between thoſe obſervations, which will not let us draw the ſame conſequences from them. Laſtly, by this method, when different obſervations upon the ſame ſubject ſeem, by the contrariety of facts, to deſtroy each other, we are enabled to perceive, on the con-

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trary, that theſe very obſervations ſerve as mutual correctives to each other, preſcribe to each its juſt bounds, ſeverally bring themſelves to their intrinſic value, and are neceſſary to determine vague and diſagreeing truths which lead to errors in practice.

But this taſk requires much application: For the facts which may tend to the improvement of our art, do not ordinarily clearly occur upon a ſuperficial reading of obſervations, but eſcape even perſons of no mean penetration. They very ſeldom ſtrike us, and attract our attention, but when we are employ'd in illuſtrating ſome point of doctrine, with which they have ſome connexion, and which renders them intereſting to us. On ſuch occaſions we are ſometimes ſurpriſed to be conducted to ſome very uſeful piece of knowledge, by an aſſemblage or concurrence of various obſervations, which before ſeem'd to contain nothing remarkable. Thus, we ought to entertain very different notions of the utility of obſervations, from ſuch as naturally occur to thoſe who have not conſider'd the ſubject ſufficiently, that is, to thoſe who never conſult obſervations but in difficult caſes. The advantage they expect to reap from obſervations is very ſmall; for we rarely find that ſuch as give us the hiſtory of diſeaſes they have treated, judiciouſly riſe above the ordinary rules, and, to ſupply us with examples, furniſh us with *maſterly ſtrokes*, which we may prudently imitate in ſome caſes, where there are no precepts to direct us, and where genius muſt ſupply the defects of art. If the uſe of obſervations went no further, there would be very few worth printing. But, as we have remark'd, they are of much more extenſive uſe, and we cannot have too many; for we muſt often look over a great number to find the particular facts which will contribute to eſtabliſh or illuſtrate ſome truth, or

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but to limit it on one ſide; and in theſe reſearches, we (generally) find that the fund of obſervations we have at preſent, is far from being large enough to furniſh us with the knowledge and experience deducible from ſuch hiſtories.

We muſt, therefore, make laborious enquiries, collect abundance of facts, and range them on that ſide which relates to the ſubject we intend to examine, in order to obtain ſome light, from their aſſemblage, to ſettle, not an entire cure, but a ſingle point of practice. Now it is evident that this taſk exceeds the abilities of young ſurgeons, as it does of thoſe who are only verſed in the theory of this art, and alſo of thoſe who are nothing more than practitioners. The former are not ſufficiently ſkill'd in manual operations, and the power of the art, to perceive what changes and improvements may be made in it; and the latter have not knowledge enough to penetrate into the myſteries of obſervation, and make new practical diſcoveries. It often happens that obſervations fail of inſtructing even thoſe who communicate them; for obſervers ſeldom view facts on the moſt inſtructive ſide: The violence of the diſeaſe, and the ſucceſs of the cure, are generally the two objects which ſtrike them moſt. The ſurgeon, however, has ſometimes no great ſhare in the moſt conſiderable cures; and frequently contributes nothing more to them, than by acting according to the beſt known and moſt common precepts. An obſerver can have no other reaſon for flattering himſelf that the reputation of the cure will always be aſcribed to him, but becauſe the wonderful effects of nature, and of the art, are eaſily confounded with the procedure of the artiſt. Nothing but nature ought to ſpeak in obſervations: But her language, even when it is faithfully repreſented, is moſtly dark or dubious, and even frequently deceitful, and cannot be interpreted otherwiſe than by the con-

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concurrence of thoſe lights which an extenſive practice, join'd with a ſcientifical theory, afford. Conſequently none but ſuch as are eminently ſkill'd in both, can diſtinguiſh reality from appearances in obſervations, point out the wrong ſteps which are authoriſed by an equivocal and tranſient ſucceſs, and diſcover good practice, even in caſes where it has not been attended with ſucceſs.

It would, therefore, be a groſs impoſition on young ſurgeons, to give them particular obſervations for models to direct them, who ſtand in need of ſure and accurate inſtructions to guide them in practice. The beſt and only method they can take is, to attach themſelves to the eſtabliſhed and experienced maxims and rules of ſuch able ſurgeons, as know how to make obſervations ſubſervient to the correcting falſe and injudicious precepts, to verify thoſe which are yet dubious, to fix the bounds of thoſe which are only eſtabliſh'd in a vague and undetermined manner, and to enter, by examples, into the detail of particular caſes, which cannot be reduced to the ordinary rules, and the extent of which we do not yet ſufficiently know, ſo as to fix and reduce them to precepts.

From all theſe reaſons, the reader will ſee that the intention of the academy, with reſpect to the uſe of the practical facts communicated by its members or correſpondents, is not to be ſolely confin'd to the collecting theſe facts, and giving bare relations of obſervations*. She has a much more eſſential taſk in view, and more worthy of her labour; ſhe looks upon moſt of the obſervations, with which ſhe can enrich the art, only as remote means

* The academy thinks herſelf obliged to publiſh the collection of obſervations communicated to her, that the maſters of the art, who ſhall attempt to decide or illuſtrate any point of theory or practice, may make uſe of them in their memoirs. This collection will conſiſt of ſeveral volumes, beſides thoſe which will contain the memoirs; in which latter we ſhall only give ſuch uncommon and ſingular caſes, as may ſingly, without the concurrence of others, be of eminent and certain uſe.

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means conducive to bring it to perfection. Neither can ſhe anſwer her intended end of contributing thereto by all poſſible ways, otherwiſe than by making it her principal ſtudy, by the aſſiſtance of theſe facts, and of thoſe which are to be met with in the writings of the antients and moderns, to determine dubious or unſettled points of practice; to detect the bad methods, introduced by prejudice, and favour'd by falſe appearances; and to diſcover and fix the genuine indications to be purſued in doubtful caſes.

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MEMOIR II. *By M.* PETIT, *the Son.*

ESSAY *upon* Extravaſations, *and particularly thoſe of* Blood.

THIS memoir ſhall conſiſt of ſix parts. In the firſt I ſhall treat of extravaſations in the *abdomen*. Thoſe in the cavity of the breaſt, and under the *cranium*, with thoſe extravaſations which happen in the various external parts, ſhall be the ſubject of the three next. In the fifth I ſhall examine the different terminations of theſe extravaſations: And in the ſixth and laſt, I ſhall propoſe various experiments that may be made, in order to prove certain points which I have only advanced on the footing of analogy.

Plan of the author conſiſts of ſix parts.

PART I.

Extravaſations in the Abdomen.

I Shall begin this firſt part by a detail of ſome obſervations; after which I ſhall enquire how an extravaſation in the *abdomen* is made, and ſpecify the conſequences which ought to be drawn from it; laſtly, I ſhall eſtabliſh ſuch ſigns as may ſurely indicate an extravaſation in the *abdomen*; and theſe three different points will make as many articles.

ARTICLE I.

Containing ſome Obſervations relating to this firſt Part, of Extravaſations in the Abdomen.

FOR the following obſervation I am indebted to M. *d'Argeat*, whoſe ſkill, and attachment to truth, are univerſally acknowledged. A ſoldier, of

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of the regiment of *Normandy*, about twenty-four years of age, had been wounded by the thruſt of a ſword, a little below the *cartilago enſiformis*, and below the cartilaginous edge of the ſpurious ribs on the right ſide. It was about ſix of the clock in the evening when this ſoldier was wounded, and he vomited a little after; but M. *d'Argeat*, then ſurgeon of the ſame regiment, was not called till next morning at ſeven of the clock. He found the patient labouring under a conſiderable fever, a difficult reſpiration, and a hardneſs and tenſion of the whole epigaſtric region, the reſt of the *abdomen* appearing in its natural ſtate.

I. Obſervation, by M. *d'Argeat*, on an aperture made in the hypogaſtric region, in order to procure the diſcharge of blood ex, ravaſated in the cavity of the *abdomen*.

The external wound was very ſmall, ſince it was not, at moſt, above five lines in extent. M. *d'Argeat* preſſed it in different parts, in order to ſee whether it would diſcharge any blood, five or ſix drops of which could only be obtain'd. He did not judge it expedient either to probe the wound, or to dilate it by making an inciſion. He only applied to it a compreſs dipt in vulnerary water, covered the whole *abdomen* with a thick compreſs, dipt in a decoction of worm-wood, camomile, and St *John*'s wort, and order'd the ſame fomentation to be renew'd every four hours.

M. *d'Argeat* order'd his patient to be blooded three times in one day, and made him take, in ſpoonfuls, a potion compoſed of half a dram of the confection of hyacinth, fifteen grains of crabs-eyes, as much prepar'd coral, one grain and an half of laudanum, and ſix drams of the ſyrup of violets, the whole diſſolv'd in four ounces of the diſtill'd waters of ſuccory and carduus benedictus. Tho' the patient had only vomited once after the reception of his wound, yet M. *d'Argeat* ſuſpecting that the ſtomach was penetrated, order'd that he

ſhould

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ſhould have no aliments except two or three ſpoonfuls of broth every hour.

During the night, the patient ſlept at different intervals, and next morning, things remaining nearly in the ſame ſtate, he was conducted to the hoſpital of *Beſançon*. M. *d'Argeat* continued to viſit him daily, with M. *Vacher*, ſurgeon-major of the hoſpital. Theſe two gentlemen agreed that the patient ſhould be dreſſed as in the evening before, that he ſhould be blooded thrice more, that the fomentation on his *abdomen* ſhould be continued night and day, and that at night he ſhould take a julep like that above deſcribed, which compoſed the patient, and procured him ſome hours of ſound ſleep.

On the third day his fever was much abated, the region of the liver and ſtomach was leſs tenſe, and the reſpiration more free. The patient was blooded the ſeventh time, and as he had not had a ſtool ſince the reception of his wound, they order'd him a clyſter, which produced the deſired effect. In order to remove his coſtiveneſs, M. *d'Argeat* propoſed to boil an ounce of ſena, in three quarts of the decoction uſed for the fomentations on his *abdomen*. By this addition to the fomentations, the patient had a ſtool or two regularly every day; next night a julep was alſo ordered for him.

On the fourth day the patient found himſelf much relieved; the epigaſtric region had almoſt loſt its tenſion, the fever was very much diminiſh'd, the reſpiration was much more eaſy, and the wound was reunited, ſo that they contented themſelves with continuing the fomentations.

On the fifth and ſixth days he continued in the ſame ſtate, but being ſeiz'd with a looſeneſs, and having been at ſtool ſeven or eight times in twenty-four hours, meſſieurs *Vacher* and *d'Argeat* agreed to take the ſena from the decoction uſed for the *abdomen*. The looſeneſs continu'd till the tenth day, and

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and as it became troubleſome, with an intention to moderate it, the patient was order'd to take a doſe of the confection of hyacinth, by which, without any other remedy, it was ſtop'd.

On the ninth or tenth day it was perceived that, towards the hypogaſtric region, the *abdomen* was ſwell'd, not without pain. On the eleventh the ſwelling and pain of the hypogaſtrium became much more ſenſible, and, on account of this ſymptom, the tenſion and pain of the epigaſtric region were renew'd, and the fever, which, on the eighth and ninth, was almoſt totally extinguiſh'd, return'd with as much violence as on the firſt. The irritation being communicated to the bladder, the patient was ſeized with an exceſſive deſire of making water, but could only diſcharge his urine drop by drop.

On the twelfth the *abdomen* was ſtill more ſwelled and tenſe. Then M. *d'Argeat*, who had frequently obſerv'd ſimilar ſymptoms, in wounded patients who had died of extravaſations in the *abdomen*, ſuſpected that this ſoldier was really in ſuch a caſe. This ſuſpicion engaged him to examine the *abdomen* carefully, on which he perceived a ſomewhat larger elevation on the right ſide. Beſides, tho' the tenſion of the muſcles did not permit him diſtinctly to feel the undulation or fluctuation, yet, by attentively handling the tumor of the *abdomen*, it appeared to contain a collection of matter. This ſymptom, obſcure as it was, joined to the other circumſtances, made M. *d'Argeat* ſuſpect that there was an extravaſation in the lower part of the *abdomen*.

Meſſieurs *Vacher*, *d'Argeat*, *Bernier*, and *Morel*, having met to deliberate on the method moſt proper to be taken, agreed to make an aperture in the tumified part of the *abdomen*, becauſe they thought they perceived the collection of extravaſated matter by the touch. M. *Vacher* perform'd the operation on

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on the most prominent part, which was on the right side, between the anterior and superior spine of the *os ileon*, and the tuberosity of the pubes, an inch above the ringlet of the *musculus obliquus externus*, parallel to the *musculus rectus*, and about a finger-breadth from it.

The incision in the skin was about two inches long, but the aperture in the *peritonæum* was only sufficient to admit the point of the little-finger. As soon as the *peritonæum* was open'd, there issued at least three pints of a black and very fluid blood, which seemed diluted with some serum.

This wound was dressed with a tent of linen, about half an inch in circumference, introduced into the *abdomen* about two finger-breadths, leaving a pretty long end without, which was secured by pledgets, a plaister, compresses dipt in aromatic wine, and the bandage commonly used for the trunk of the body.

Next day there was discharged, from the aperture of the *peritonæum*, about a pint of blood, like that evacuated immediately upon the operation, and after this the symptoms began to diminish.

At the third dressing there came forth only a small quantity of blood mix'd with pus. Wine mix'd with honey was injected into the *abdomen*; but this injection, creating some pain to the patient, was left off in two or three days, and in its stead was used only a decoction of barley, with a little honey of roses dissolved in it. About the fourth or fifth day after the operation, there was a very copious suppuration, and as soon as this began to be diminish'd, the injections were given over. Soon after the patient slept well, was free from his fever, perceived no more pain, and by the care of M. *Vacher* was intirely cured in thirty-six days. The patient has since followed his business, and tho' M. *d'Argeat* shew'd me him two years after, yet I did

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did not perceive any diſpoſition to an hernia in the part where the inciſion had been made.

II. Obſervation of the author, on the ſame ſubject.

A ſoldier received a thruſt of a ſword a little above, and on the left ſide of the navel. He was at firſt ſeiz'd with a vomiting, to which ſucceeded a painful tenſion in all the lower part of the *abdomen*, eſpecially near the wound, which was only two or three lines in length, and was dreſſed ſimply with a compreſs dipt in aqua vitæ, and ſecur'd by the bandage for the trunk of the body. The patient was blooded in the arm, and remain'd without any other aſſiſtance till the ſixth day, when he was brought to the hoſpital at *Spires*, which was eſtabliſhed for thoſe wounded at the ſiege of *Philipſburgh*, and of which I then had the care as ſurgeon major of the army.

The firſt time I viſited this patient, I found his *abdomen* ſomewhat inflated, flaccid, and without pain, except in the part of the wound, where was ſtill ſome ſlight pain on preſſing ſomewhat hard upon it. There was about the wound a certain blackneſs, which might have been as readily taken for a gangrenous ſpot, as for a ſimple ecchymoſis, eſpecially conſidering the bad ſtate of the patient, for he had a continual hiccup, vomited as ſoon as he took any thing, had a bilious flux, and for the moſt part diſcharg'd his excrements involuntarily. He was extremely weak and extenuated, and his pulſe ſo little and concentrated, that it could hardly be felt.

Tho' ſo deplorable a ſtate indicated a gangrenous inflammation of the *abdomen*, yet I choſe rather to hope for the beſt, againſt all probability, than to abandon the patient to certain death. I acted therefore conformably to the only ſuppoſition according to which any hopes of his recovery could poſſibly be conceiv'd; for as I imagin'd that the gangrene was not as yet perhaps confirm'd, I did all I could

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to ſtop its progreſs. Notwithſtanding the extreme weakneſs of his pulſe, I order'd frequent ſmall veneſections in the arm. I applied, over the whole *abdomen*, linen cloths, dipt in a warm decoction of emollient and reſolvent herbs, to which I added a fourth part of aqua vitæ; and theſe fomentations were often renew'd. At the ſame time, with a view to comfort his ſtomach, moderate his looſeneſs, and recruit his ſtrength, I made him take a ſpoonful of a potion every hour, compoſed of a dram of the theriaca, half a dram of the confection of hyacinth, and fifteen drops of lilium, in four ounces of an infuſion of the tops of wormwood. I forbad the vulnerary draught, and order'd that he ſhould have no other nouriſhment than, every two hours, four ſpoonfuls of broth, with about the fourth part of the yolk of an egg diluted in it; and to appeaſe his thirſt, I permitted him now and then to take a mouthful of a gentle nitrated emulſion.

After the firſt four veneſections, which were made in the ſame day, the patient, inſtead of being weakened, had his pulſe raiſed, and the hiccup ſomewhat abated. His nauſeas and vomitings return'd leſs frequently, and his ſtomach retain'd ſome aliments or medicines. Next day I order'd him to be blooded three times more, and the ſame regimen to be obſerv'd, by which means he became a little better, and was able to take a larger quantity of liquor without vomiting it up; the hiccup, however, continued, as well as the looſeneſs. On the eighth day he was blooded three times more, and his pulſe ſeem'd ſtrong enough to render the continuance of the potion needleſs. I only ordered him in the morning and evening a doſe of diaſcordium, to check his looſeneſs, and added an half of camphorated aqua vitæ to the decoction of emollient and reſolvent plants.

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From the eighth till the twelfth day, the patient remain'd in much the ſame ſtate, and was blooded five or ſix times during that interval. From the twelfth to the fifteenth his *abdomen*, which was become a little leſs inflated and flaccid, ſeem'd to ſwell again, and on the ſixteenth there appear'd, on the right ſide of the navel, a blackneſs like that which before appear'd about the wound, and which ſtill ſubſiſted.

This blackneſs, which I with ſtill more reaſon, as I thought, conſider'd as a ſign of a gangrene, did not permit me to ſuſpect that there was any other cauſe of the ſeveral ſymptoms which I perceiv'd. I look'd upon the patient as a man who had only a few hours to live, and for whom there remain'd no more to be done; notwithſtanding which, he continued three days in the ſame ſtate, during the whole of which time, he was thought ſo near death, that every body was ſurpriſed to find him every night and morning ſtill alive. On the nineteenth from the reception of his wound, he ordered me to be called to his relief. He had labour'd under frequent inclinations to make water without effect. Inſtead of his former looſeneſs, he had not been at ſtool for two days. The hiccup was continual, and the vomiting very frequent. His *abdomen* was much more elevated, tenſe and painful, eſpecially about the hypogaſtric region, and he had a high fever.

As the retention of urine might poſſibly be a new cauſe of heightening the ſymptoms, I ſounded the patient, who was by that means relieved, tho' there was but little urine in the bladder. Theſe irritations of the bladder, join'd to the elevation of the *abdomen*, and the painful tenſion of the hypogaſtric region, began to make me ſuſpect an extravaſation in the lower belly. But imagining that this extravaſation was the conſequence of ſome a-

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perture made by the gangrene of the inteſtine, I did not believe that the patient could live till next day; notwithſtanding which, I found him ſtill alive, but in a very deplorable ſtate. He vomited without interruption, and diſcharg'd, as it were, by regurgitation, a bilious and ſtercoraceous ſubſtance. This circumſtance remov'd the notion I had conceived of an aperture of ſome inteſtine, and convinced me that the extravaſation was of another nature, and that the extravaſated matter in the *pelvis*, compreſſing the neck of the bladder, and the inteſtinal duct, was the cauſe of the retention of urine and the vomiting the feces.

I knew that, in ſimilar extravaſations, an aperture of the *abdomen* had been ſucceſsfully made by the advice of M. *d'Argeat*; and tho' the ſtate of the patient gave me not the leaſt glimpſe of hopes, yet his condition appear'd ſo inſupportable, that I readily yielded to his ſollicitations to attempt ſomething for his relief.

I, therefore, made an inciſion in the *abdomen*, an inch above the anterior and ſuperior ſpine of the *os ileum*, and parallel to the *muſculus rectus*. I made this inciſion on the right ſide, becauſe on it the hypogaſtrium appear'd more elevated than on the other. As ſoon as the *peritonæum* was open'd, there burſt out more than two pints of blood, which was black, infected and diluted with ſerum. More would have been diſcharg'd, if I had not moderated its evacuation, for fear of too much weakening the patient. I put into the wound a ſmall tent of linen, which did not ſo ſtop the aperture as to hinder the extravaſated matter from being inſenſibly evacuated between one dreſſing and another. Immediately after the operation, the patient vomited no more, and was much leſs afflicted with the hiccup. But he did not enjoy this relief long, for the gangrene of the inteſtines, arriv'd at a great height, put an end

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end to his life, twenty-four hours after the operation, and the twenty-firſt day after the reception of his wound.

Notwithſtanding the great quantity of matter diſcharg'd immediately after the operation, and that afterwards evacuated ſo copiouſly as to wet ſeveral cloths, I found, upon opening the carcaſe, more than a pint of bloody matter, extravaſated in the *abdomen*, but not diſperſed thro' the depreſſions and foldings of the meſentery, inteſtines and other viſcera; tho' 'tis generally, but falſly believ'd, that this muſt happen when there is any extravaſation in the *abdomen*. The extravaſated matter had but one center, and was included, as it were, in a particular lodging. The cavity of the *pelvis* was the bottom of this lodging, and higher up, the inteſtines, glu'd to each other, form'd a plate, which, adhering in all its circumference to the *peritonæum*, determin'd the center of the extravaſation.

This center was unequally circumſcrib'd, and this unequal circumſcription, no doubt, depended on the irregularity with which the blood had ſpread itſelf after its extravaſation. According as it had met with more or leſs reſiſtance, it had inſinuated itſelf more or leſs forward into ſome of the windings of the inteſtines, ſo that theſe windings form'd a kind of burrows, or ſinuſes, which were more or leſs deep, but all communicating with the common center, and diſcharging themſelves into it; ſo that the aperture, we had made in the *abdomen*, was alone ſufficient to evacuate the whole of the extravaſated matter. The internal part of the cavity; which conſtituted the center of the extravaſation, was cover'd with a lymphatic pellicule, cloſely adhering both to the *peritonæum* and to the inteſtines. This pellicule was ſufficiently ſolid to form a kind of bag, about half a line thick, which might be ſeparated without breaking, and had been able to retain the ex-

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travaſated fluid, independently of the adherence of the inteſtines to each other, and to the *peritonæum*. This adherence was very eaſily deſtroy'd by the finger, which always happens when the inflammation is ready to degenerate into a gangrene. The bag, or cyſtis, we have mention'd, was internally cover'd with a blackiſh concretion, like that found under the lymphatic pellicule of blood coagulated in porringers. This concretion was only a line or two thick, almoſt thro' the whole of its extent. It was of a pretty firm conſiſtence on that ſide where it was confounded with the lymphatic pellicule, but internally it was very ſoft, and as it were diluted. Some concretions entirely detach'd, and ſtill more ſoft and diluted, floated in a bloody ſerum.

Abſtract of ſome other obſervations of the author, with remarks on extravaſations in the *abdomen*.

The caſe laſt related is not the only one in which I have obſerv'd, that, when there is any extravaſation in the lower belly, this extravaſation has but one common center. Since the obſervation juſt related, there has not died in the hoſpitals of which I had the charge, a ſingle patient, whoſe wound penetrated into the *abdomen*, whom I have not open'd, and all theſe obſervations have confirm'd the firſt. I have ſometimes found the extravaſated blood lodged about the aperture of the veſſel, without ſpreading very far. At other times I have remark'd, that the blood had form'd roads for itſelf to a conſiderable diſtance; and in this caſe, I have almoſt always obſerv'd, that there was a communication between the blood at the greateſt diſtance from the aperture of the veſſel, and that which, flowing laſt out, had really cloſed up this aperture by being coagulated.

It is true that I have ſometimes found two or three extravaſations, each of which had its diſtinct center. But this was the conſequence of gun-ſhot wounds, or thoſe inflicted by ſwords, which penetrating

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trating far into, or quite thro' the *abdomen*, had wounded different parts, and thus open'd two or three conſiderable veſſels, ſufficiently diſtinct and ſeparate from each other to form two or three and even a greater number of particular extravaſations; and, even in theſe caſes, I have often obſerv'd, that the particular extravaſations have ſmall communications, or continuities, ſo that, properly ſpeaking, we may aſſert that they have a common center.

There is ſtill a caſe wherein, on opening carcaſes, I have found extravaſations multiplied, even when there was but one ſource to furniſh the blood. This has happen'd when I open'd the bodies of perſons who have died ſoon after their wounds, ſo that the extravaſated blood had not time to coagulate before their death. In the following article the reader will find a reaſon why, in ſuch caſes, we meet with vague and multiplied extravaſations. It is the difference between the concretions of blood form'd after death, and thoſe form'd during the patient's life, that has enabled me to diſtinguiſh theſe caſes; and I have ſince always remark'd, that when the center of the extravaſation was vague, indetermin'd and multiplied, the concretions had the character of thoſe form'd after death; whereas, when the concretions had the character of thoſe form'd during life, I always found that the extravaſation had but one center; and this, as we ſhall afterwards perceive, is an obſervation of very great importance.

When the blood is coagulated during the patient's life, I have always obſerv'd that the whole ſurface of the concretion was cover'd with a lymphatic pellicule, almoſt equally thick every where, and pretty intimately adhering to the viſcera which form the center of the extravaſation. On the contrary, the concretion which is form'd after death, is not cover'd with a lymphatic pellicule, at leaſt ſuch a one as is uniform, and extends itſelf equally over all its

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ſurface. Neither has it any adheſion to the viſcera, between which it is included, and from which it is as much detach'd as coagulated blood is from the ſides of the porringer. The ſerum ſeparated from the concretion form'd after death, detaches it from the adjacent parts, juſt as the ſerum ſecreted from blood coagulated in a veſſel ſoon after diſengages it from the ſides.

Another very remarkable difference between the concretion form'd during life, and that form'd after death, is, that this laſt is always ſoft, of an equal conſiſtence in all its ſubſtance, and on that account very like the concretion form'd in a porringer, except that it has not a lymphatic pellicule, at leaſt ſuch a one as is near ſo perceptible, firm and hard, as that moſt generally form'd on blood taken from the veins by veneſection. This does not hold true, with reſpect to the concretion of blood form'd in the *abdomen* during life, for this is not of an equal conſiſtence every where, ſince, as I have already ſaid, it is ſurrounded or cover'd with a lymphatic pellicule, which, by the ſolidity it daily acquires, forms a ſort of membrane, and is, as we evidently perceive, much firmer than the reſt of the concretion. The body of the concretion form'd during life is alſo more ſolid and firm than the other concretions, eſpecially during the firſt days of its formation; for, afterwards, it becomes ſoft, looſe, and diluted. But in ſuch caſes the time which intervenes between the wound and the patient's death, ſeems ſufficiently to indicate that the blood was coagulated during life. It ſeems needleſs to obſerve that there can hardly be a very ſenſible difference between the concretion which begins to be formed a few hours before death, and that which is only form'd after death.

There are not only differences between concretions form'd in the *abdomen*, during life and after death,

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death, but I have alſo obſerved, that all extravaſated blood does not coagulate in the ſame manner during life; and we may eaſily conceive, that in this, there muſt be an infinity of variations, according to the quality of the extravaſated blood, whether arterial or venal, pure or mixed, natural or peccant; as alſo according to the quantity of the extravaſation, and eſpecially according to its form, that is, according as the extravaſated blood is conſtrained to aſſume a particular figure, which contains more or leſs ſolidity, in proportion to its ſurface.

In theſe different caſes, the coagulation of the blood muſt not only be more or leſs quick, but the concretion muſt have alſo different conditions, on which the different terminations, and conſequently the different ſymptoms, of the extravaſation will depend. It is eaſy to perceive the extent and the difficulty of the reſearches which might be made, concerning the different modifications which blood extravaſated in the *abdomen* undergoes, and which are certainly no leſs various than thoſe daily obſerv'd in extravaſations of blood and ecchymoſes in the external parts.

In order to finiſh this article, it only remains that I ſhould mention the laſt caſe, in which we may, upon opening carcaſes, find extravaſated fluids vaguely ſcattered, without any particular center, tho' the patients have not died for ſome days after their wounds. This happens when the adherences, which at firſt limited the center of the extravaſation, are deſtroyed by any cauſe whatever. This unfortunately happened to a patient, whoſe death I greatly lament. He had received a thruſt of a ſword on the right ſide of the *abdomen*, an inch below and on the ſide of the navel. It was on the thirteenth day after he had received his wound that I ſaw him. The importance of the wound, and the ſymptoms with which it had been accompanied, made me very attentive

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tentive to it; and as by the ſigns enumerated in the third article, I was convinced, that the patient had an extravaſation in the *abdomen*, I reſolved next day to perform a proper operation upon him. But it happened quite otherwiſe; the ſame day the patients were removed, and tho' I had exactly mark'd thoſe who were fit for a tranſportation, as is uſually obſerved, yet this patient, whoſe parents lived in the town whither they were to be tranſported, ſo importuned one of the wardens of the infirmary, that he prevailed on him to let him go, and accordingly he ſet out in a waggon. The deſire of arriving at his journey's end made him patiently ſupport the firſt joltings of the waggon, but he had hardly gone a quarter of a league, when he complained of a colic, gripes, and an inſupportable pain of the whole *abdomen*. He vomited, went ſeveral times to ſtool, and diſcharged his excrements involuntarily; his pulſe became weak, hard, concentrated and irregular; he had frequent ſyncopes, and ſome hours after his arrival died under theſe ſymptoms. The ſurgeon, who accompanied that convoy of ſick, acquainted me with what I have related, and told me that, upon opening the carcaſe, there were about three pints of black and very fluid blood found ſcattered up and down his whole *abdomen*; and that in the epigaſtric region, below the wound, there were adheſions, which formed a kind of bag, in which was a little coagulated blood. This recital augmented my regret ſtill the more, becauſe it convinced me that the operation I intended to have performed would have infallibly preſerved his life.

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MEMOIR III. *By M.* QUESNAY.

Of the different Caſes in which it is neceſſary to multiply the Operation of the Trepan, *and evincing, by remarkable Examples, that, upon neceſſity, a great Extent of the* Cranium *may be opened with Succeſs.*

CASE I.

FRACTURES which happen on ſutures generally render it neceſſary to trepan on both ſides of ſuch ſutures, leſt the *dura mater* ſhould, notwithſtanding the blow, remain adherent to the part where the ſuture is, examples of which may be ſeen in the ſeventh and ninth obſervations of the diſſertation on the trepan in dubious caſes. In a caſe of this nature, the trepan applied on the ſuture might give a ſhock to this membrane, for which reaſon it is ſafer to place it at the ſide of the ſuture. But if we ſhould only trepan on one ſide, and if the *dura mater* ſhould really adhere to the ſuture, this adheſion hinders the fluids, extravaſated on both ſides, from being evacuated thro' this ſingle aperture. It is therefore requiſite to open the *cranium* on both ſides of the ſuture, in order to give a free vent to the extravaſated matter. Thus the ſame reaſon, which induces us not to trepan on the ſuture, alſo lays us under a neceſſity of multiplying trepans. However, if, according to *Berengarius*, and ſome other authors*, it were true that the *dura mater* was almoſt always detached from the ſuture, by the force of the blow, and if the trepanning in that part was not ſo much to be dreaded, as it is generally thought, it would be equally true, that it would be very ſeldom neceſſary

Fractures on the ſutures.

* See theſe authors quoted in *Robault*'s treatiſe on wounds of the head. *p.* 89.

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ſary to trepan on both ſides of the ſuture. For if the *dura mater* be not really adherent to the ſuture, all the extravaſated matter may be evacuated from a ſingle aperture, eſpecially if the fracture was not of a great extent, and if the trepan was applied on the ſide to which it extended moſt. But experience has ſo often convinced us of the neceſſity of trepanning on both ſides of the ſuture, that this method is laid down as a precept to be exactly obſerved. The great diviſions of ſutures confirm the ſame practice, ſince the diſcharge which theſe diviſions furniſh for the extravaſated matter is often only ſufficient for one ſide. In this caſe, notwithſtanding the diviſion of the ſuture, the *dura mater* ſtill remains attached to the edge of one of the divided bones, and this attachment forms a kind of partition, which hinders the matter extravaſated under the bone to which it adheres, from being evacuated thro' the diviſion; ſo that there is a neceſſity for proceeding to the operation, in order to procure a total evacuation to the extravaſation, as is obvious from M. *Mouton*'s obſervation before related. Hence it appears to be by no means probable that the *dura mater* is ſo frequently detached from the ſutures in fractures, as is generally believed, and that it is ſafer not to trepan on theſe ſutures, but to apply a crown of the trepan on each ſide of them, and even more, if the extravaſation or fracture require them, as is evident from the following obſervation.

I. Obſervation, by M. *Benoit*, on a fracture with fiſſures on the ſagittal and lambdoid ſutures.

A bombardeer, fifty-five years of age, was wounded, by a muſket-ſhot, upon the middle and hinder part of the ſagittal ſuture. The wound was attended with a fracture and fiſſure. M. *Benoit*, in order to be aſſured of the extent of this fracture, made a crucial inciſion, by which he laid bare the greateſt part of the parietal bones. It happened that the fracture extended to the occipital bone,

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bone, and that the operation of the trepan was extremely neceſſary, tho', on account of the hemorrhage, he was obliged to delay it till next day. He applied three crowns of the trepan, two on one ſide of the ſagittal ſuture, and one on the other, by means of which he removed ſeveral large pieces from the two parietal bones, and from the occipital. The aperture left by theſe pieces of bones did not render it neceſſary for M. *Benoit* to apply a fourth on the other ſide of the lambdoidal ſuture, though this would have been requiſite in a fracture which had extended beyond this ſuture. This wound, tho' very conſiderable, and of the gun-ſhot kind, was not ſucceeded by dangerous ſymptoms, but was perfectly cured in four months.

If practice approves of the circumſpection, which anatomy teaches us, not to trepan upon the ſutures, it is principally on account of the ſinuſes which are placed under ſome of theſe ſutures, and are attached to them, particularly the longitudinal ſinus, which runs in the ſame direction with the ſagittal ſuture. The lateral ſinuſes do not lie under the lambdoidal and ſquamous ſutures, except in croſſing them near the part where theſe two ſutures are united, and in repaſſing towards the baſe of the *cranium* under the lambdoidal ſuture. Independently of the ſinuſes, the adherence of the *dura mater* to the bones of the *cranium*, which is ſtronger at the ſutures than elſewhere, alſo lays ſome foundation for that precept, which forbids trepanning on the ſutures, becauſe we might, as we have already obſerved, wound that membrane when its adheſion reſiſts the force of the blow. There are, however, ſome obſervations which ſhew us that there are caſes in which this precept ought not to deter us from trepanning on ſutures.

There are ſome caſes in which 'tis neceſſary to trepan upon the ſutures.

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II. Obſervation, by M. *Volpiliere*, on a fracture of the temporal bone, in which he trepan'd on the temporal future.

A tanner, of about twenty-ſeven years of age, and of a robuſt conſtitution, fell from the top of a rock, and fractured almoſt all the left parietal, and a part of the temporal bone. This fracture was accompanied with a wound, which denudated a part of the ſuperior and left lateral portion of the coronal, the whole parietal, and the temporal bone, the crotaphite muſcle being entirely ſeparated from it, as if by a diſſection. M. *Volpiliere* ordered the patient to be blooded, and dreſſed the wound, taking care to preſerve the detached fleſh; he then ordered the veneſection to be repeated, and delayed the trepan till next day. As the fracture was one of the moſt conſiderable kind, M. *Volpiliere* was obliged to apply two crowns of the trepan, and to place one of them on the temporal future, which was ſucceeded by no bad ſymptoms. On the ſame day the patient was blooded in the foot, and next day twice in the arm. The *dura mater* was gangrened as far as the fracture went, notwithſtanding which the cure was happily compleated. The exfoliations began on the twenty-ſecond day, the crotaphite muſcle, and the threads which were detached, united very well, and the patient was cured of this terrible wound in two months, tho' three weeks after the operation there appeared pocky ſhankers on the glans and prepuce, which were diſſipated by the uſe of proper remedies. There is one caſe which, above all others, renders it ſometimes neceſſary to trepan upon the ſutures, and to multiply trepans; and that is, when there is a depreſſion, or a piece of bone, which compreſs the ſinuſes, and oblige the ſurgeon to make apertures on the ſutures, ſufficient to raiſe the bone, or remove the fragments of bones, with that eaſe and precaution, which art and the ſafety of the patient require.

M. *Ga-*

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M. *Garengeot* ſpeaks of a ſimilar fracture with depreſſion, in a child, on the ſagittal ſuture. He firſt applied five crowns of the trepan, which were not ſufficient to enable him to raiſe a piece of bone, that compreſſed the longitudinal ſinus, and kept the patient in a very violent fit of a lethargy. He was therefore obliged to apply two crowns more, one of which was on the ſagittal ſuture, that is to ſay, on the longitudinal ſinus itſelf. By means of theſe trepans he relieved that ſinus, and the child was inſtantly delivered from the ſymptoms, which would otherwiſe ſoon have proved mortal. *Scultetus** alſo applied to the crown of the head, round the circumference of a depreſſion on the ſame ſinus, five crowns of the trepan, and, by cutting between the ſeveral apertures, removed the whole depreſſed part of the bone. The ſame practitioner † applied ſeven for another depreſſion on that ſinus. He diſengaged the piece of bone like the former, and removed it, and theſe operations ſucceeded perfectly well with him.

III. Obſervation, by M. *Garengeot*, on a fracture on the ſagittal ſuture, in which it was neceſſary to trepan on the longitudinal ſinus.

CASE II.

WHEN we apply the trepan for a fracture, where we perceive that the extravaſation poſſeſſes a conſiderable extent on the *dura mater*, that the extravaſated blood is no longer fluid, and that it produces very terrible ſymptoms, whether by compreſſing the brain, or irritating the membranes of that organ, we ought not, in ſuch caſes, to heſitate on making as many apertures by the trepan, as are neceſſary for the ſpeedy diſcharge of the extravaſation.

A young

* Armament. chirurg. obſ. 22.
† Ibid. obſ. 5.

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IV. Observation, by M. *Marechal*, in which three trepans were applied for a fracture, with a great extravasation.

A young man, of condition, was struck by a piece of wood, which fell upon his head, by which means he lost all consciousness, and was seized with a discharge of blood from the ears. The skin was not broken, but perceiving a fluctuation on one of the parietal bones, M. *Marechal* made an aperture in it, and discovered a fracture about four inches long, which ended at the coronal suture. In order to remove a great deal of coagulated blood lodged under the *cranium*, he judged it proper to apply three crowns of the trepan, and break the interstices between the perforations with the elevator; and this aperture procured a total evacuation of the extravasation. M. *Marechal* dressed the *dura mater* with the balsam of *Fioraventi*, and prevented the coming out, or inflation of that membrane, with a small compress, graduated so as to make a suitable compression. In consequence of this compress, he had no occasion for the plate of lead, which some recommend for keeping down this membrane in similar cases. After the exfoliation of the bone, the flesh of the wound, and that supplied by the *dura mater*, joined with each other, in order gradually to fill up the aperture of the *cranium*. The cicatrix was formed in two months, and became so narrow and solid, that there was no longer any motion of the *dura mater* perceived, and there was only a place, of the extent of some lines, which was not covered with hair.

V. Observation, by the same author, on a fracture, in which twelve trepans were applied.

M. *Marechal* was obliged, for another extravasation, to multiply the trepans to the number of a dozen. M. *Dionis* has mentioned this cure in his course of operations; but a similar example renders it necessary that M. *Marechal* himself should give us the history of it. He informs us that a young girl fell on one of her parietal bones, and made a considerable contusion, with extrava-

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travaſation under the ſkin. He found the patient in a lethargy, accompanied with a convulſive pulſe; ſhe had alſo vomited and diſcharged blood from her ears. M. *Marechal* opened the tumor cauſed by the fall, and diſcovered a fracture which croſſed the temporal and parietal bone, as far as the lapidoſe apophyſis. In order to follow the fracture, he was obliged to continue his inciſion, as far as behind the ear. He ſtopt the blood, and next day applied two crowns of the trepan, without rendering the patient any better. On the following day two more were applied; but the ſymptoms perſiſting, there was a neceſſity for applying no leſs than a dozen. M. *Marechal* had only left about a line between each perforation, which he raiſed with the elevator, in order to make but one aperture of all theſe perforations. The laſt being placed very low, and near the ear, facilitated the extraction of two ſmall portions of the lapidoſe apophyſis. All the coagulated blood was diſcharged, the *dura mater*, and the lips of the wound were put in a ſuppuration, and the ſymptoms ceaſed.

Extravaſations in which the blood is coagulated, even tho' conſiderable, do not always render it neceſſary to multiply the trepans; for when there are no ſymptoms which oblige us to remove the blood with all expedition, we wait till it diſſolves, and can be evacuated, as we have ſaid, by ſuppuration. But it ſometimes happens, that this diſſolution, which is always putrid, becomes highly pernicious very ſoon. In this caſe, as ſoon as we perceive it, we ought not to wait for the diſſolution of the reſt of the coagulated blood, but remove it as ſoon as poſſible. *Magatus* * furniſhes us with a remarkable example, in which this diſſolution quickly arrived at a conſiderable degree

Great extravaſations do not always render it neceſſary to multiply the trepans.

* Lib. ii. cap. 44.

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of malignity; for it diſcovered itſelf on the fifth day, by various ſymptoms, and by a diſcharge of ichorous and fetid matter, without any appearance of a purulent ſuppuration. This great ſurgeon, appriſed, by all theſe ſigns, of the imminent danger the patient was in, reſolved, with all expedition, to remove a large quantity of coagulated and very hard blood, which had been extravaſated on the *dura mater*. *Magatus* had trepann'd the patient in the firſt day, but a ſingle aperture not being ſufficient to remove the coagulated blood, he applied another trepan, about a finger-breadth from the former, and removed the interſtice, to make but one aperture of both. The pieces of bone, which he took away, were covered with ſanies, and had a very bad ſmell. The extravaſation was ſo extenſive, that he was obliged to crook the end of his probe, in order to lay hold of the indurated blood, which was at a diſtance. Notwithſtanding all his attention, he could not remove all the blood, which adhered ſo ſtrongly to the *dura mater*, that he could not every where diſengage it. But afterwards he took great care quickly to remove the remaining blood, as ſoon as it fell into diſſolution. From this obſervation we perceive that extravaſated blood ſometimes becomes highly pernicious in a very ſhort time, and that we ought to be very wary of the depravation of which it is ſuſceptible, when, in extravaſations under the *cranium*, we wait for its evacuation by diſſolution.

It is much leſs dangerous, for the patient, to multiply the trepans, in order to evacuate the extravaſated juices become pernicious, than to wait for a greater diſſolution, which would augment the danger; for not only great apertures of the *cranium*, ſuch as that already ſaid to be produced by the twelve trepans, but alſo much larger are eaſily cloſed up.

M. *Sar-*

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M. *Sarrau* informs us that he ſaw the whole parietal bone taken away, without producing any conſiderable ſymptoms. A child fell on the ſide of its head, and made a contuſion, which the ſurgeon, who firſt ſaw it, opened. The ſame ſurgeon dreſſed the wound for ſeveral months, without being able to dry up the purulent matter, which was always very copious. The child became ſo obſtinate, that he would neither keep his bed, nor obſerve any regimen. M. *Sarrau* being called, found a great ſuppuration, and, by preſſing near the lips of the wound, he perceived that the matter was diſcharged from between the fleſh and bone. But upon examining the wound and parts adjacent more attentively, he obſerved a conſiderable diviſion in the whole circumference of the parietal, and felt that bone looſe under his fingers. The ſuppuration diſcharged more and more pus, in proportion as this bone was preſſed upon. M. *Sarrau* no longer doubted but this pus came from off the *dura mater*, thro' the diviſion of the ſutures. Being perſuaded of this, he reſolved to make an inciſion on the greateſt part of the circumference of the parietal bone, in order to lay bare its ſutures. He was not miſtaken, for he ſaw the matter diſcharged from under the bone, in proportion as it was preſſed upon. This bone was ſo looſened on all ſides, that it afterwards partly came off of itſelf, and was entirely removed. The *dura mater* was almoſt all covered with granulations of fleſh, which had ſprung up under the bone before it was taken away. Theſe granulations extended themſelves farther, and reaching the edges of the hairy ſcalp, with it formed a cicatrix, ſufficiently firm to contain and defend the brain. *Raygerius* * relates a nearly ſimilar caſe of a ſoldier, who was ſucceſsfully managed by a *French* ſurgeon, for a

VI. Obſervation, by M. *Sarrau*, on the parietal bone entirely taken away.

* Ephem. Germ. an. 3. No. 278.

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blow on his head, which fractured one of his parietal bones, in ſuch a manner, that a portion of it, as large as the palm of the hand, was removed.

We find in *Blegny* * an obſervation communicated to him by M. *Tamponet*, ſurgeon in ordinary to the king, in which it is ſaid, that one of the parietals came away with ſome laminæ of the adjacent bones. The cicatrix was ſo well formed, that it perfectly cloſed up the great aperture, occaſioned in the *cranium* by the loſs of that bone. We find in the works of *Saviard*, a ſurgeon of the *Hotel Dieu* in *Paris*, a fact of the ſame kind, but much more aſtoniſhing. The ſuperior part of the coronal bone, the two whole parietal bones, and a great portion of the occipital bone, were ſeparated at the ſame time. This great extent of bone, which was detached, comprehended all the capes of the *cranium*. The patient, in order to ſupply this part, uſed the bottom of a gourd to defend his brain, and cover the cicatrix which was formed after ſo great a loſs.

There are caſes in which the juices, extravaſated under the *cranium*, come from too great a diſtance, to ſeek for an iſſue made by the trepan, or otherwiſe, ſo that a part of them can only be evacuated, whatever induſtry we may uſe in order to facilitate their diſcharge. We ought not, in ſuch caſes, to be content with the ſingle aperture firſt made; we muſt, in order to procure a ſufficient vent to the matter, multiply the trepans; but it is not always neceſſary, as in the preceding caſes, to make an aperture as extenſive as the place over which the extravaſated matter is ſpread. We may, as in fiſtulous abſceſſes of the fleſh, have recourſe to a counter-aperture, in the part where the matter is accumulated, and where we may procure it an eaſy iſſue, as M. *Chauvin* did in the following cure.

A man

* Zod. Apr. obſ. 8.

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A man received a ſmall wound by a fall: This wound was apparently ſimple, and inflicted on the ſuperior part of the occipital bone, a little to the left. The ſymptoms became ſo conſiderable, as to determine the ſurgeon to make an inciſion in the place of the wound. By this means, he diſcovered a fracture, in form of a ſtar, on the ſuperior and poſterior part of the right parietal. One ray of this ſtar extended itſelf, on the right ſide, four lines beyond the lambdoidal ſuture. He applied two crowns of the trepan, one on the occipital, and the other on the parietal bone. This operation diſſipated all the ſymptoms, only there remained a palſy in the left eye-lid. At the end of a month he perceived, thro' the aperture made by the trepan, blood, partly fluid, and partly grumous, which had been expell'd by the pulſations of the *dura mater*. For three or four days two or three ſpoonfuls of this blood were diſcharged at each dreſſing. Immediately after each evacuation the paralytic eye-lid recovered its action, but two or three hours after the palſy returned. Theſe evacuations continued, with this difference, that pus was diſcharged inſtead of blood. This pus was at firſt ſerous, but afterwards aſſumed a laudable conſiſtence. He obſerved that this pus proceeded from a conſiderable diſtance, and that it could only be diſcharged during the dreſſing, when he depreſſed the *dura mater*. M. *Chauvin*, on ſearching for the ſource of this matter, found it under the middle of the parietal bone. By advice of M. *Petit*, he had recourſe to a goutier of lead: This inſtrument was more proper on ſuch an occaſion, than the flat canula of lead, which, however, *Paré* * uſed with ſucceſs, in order to procure the diſcharge of matter under the *cranium*, thro' the aperture of the trepan, which was above its ſource. In the preſent caſe, the

VII. Obſervation, by M. *Chauvin*, on a counter-aperture in the *cranium*.

* Lib. x. cap. 21.

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intention was to prevent the inflation of the *dura mater* from oppoſing the evacuation of the matter, and the only end propoſed was to keep this membrane at ſome diſtance from the *cranium*, that ſo it might afford a free paſſage for the pus, between itſelf and the bone. The goutier was therefore the moſt proper inſtrument that could be invented, but the too low ſituation of the bottom of the ſinus hindered the ſucceſs with which it would otherwiſe have been attended. M. *Chauvin* propoſed a trepan in form of a counter-aperture, which was made, and, by the aſſiſtance of this goutier, which was neceſſary for ſome days, ſucceeded perfectly.

It is ſurprizing that we have ſo few examples of counter-apertures in the *cranium*, ſince analogy ſufficiently ſhews, from their ſucceſs on the fleſh, the advantages which might be expected from them in the *cranium*, whenever the caſe is the ſame with that which obliges us to have recourſe to them in the other parts of the body. How comes it to paſs, then, that great practitioners are not appriſed of the utility of them on thoſe occaſions, wherein they could not be neglected without expoſing the patients to death, or at leaſt to imminent danger? M. *Saviard** is ſurprized that a woman, whom he trepann'd in the *Hotel Dieu* of *Paris*, did not die, becauſe there was matter under the temporal bone, which could not be diſcharged thro' the aperture made by the trepan. Happily this matter being reduced to a ſanies, penetrated thro' the fracture, which extended to the bone that covered the matter; but the life of the patient was greatly endangered, by depending on ſuch an event for the evacuation of this matter. This ſurgeon waited for the ſymptoms to determine him to a ſecond trepan, which he was probably more afraid of, than of the preſence of a ſanious and conſequently corrupted matter; but he ran a riſque of being appriſed too late. There

* Art. des exfoliations du Crâne, Obſ. 4.

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There are ſome caſes in which injections may ſupply the place of counter-apertures. We ſhall hereafter relate an obſervation, in which M. *de la Peyronie* propoſed to make a counter-aperture, in order to give vent to a purulent matter, lodged under the middle of the *os frontis*, and which could not be totally diſcharged thro' the fracture on the lateral part of the ſame bone, which is covered by the anterior part of the temporal muſcle. M. *de la Peyronie*, however, was willing to try the uſe of injections, before he determined to make the counter-aperture, which was prevented effectually by theſe injections. In the days of *Paré*, ſurgeons would not venture to trepan under the temporal muſcles, which obliged that practitioner to trepan above a fracture under that muſcle, and he had recourſe to injections, in order to remove the juices extravaſated oppoſite to the fracture. By this expedient he remedied the inconveniences, to which he was expoſed by a falſe and groundleſs circumſpection, which was thought neceſſary in thoſe times.

CASE III. *In* CARIES.

CASES which require a multiplicity of trepans, and the removal of large portions of the *cranium*, principally occur from a caries in thoſe parts.

VIII. Obſervation by M. *Daviel*, in which eight trepans were applied for a conſiderable caries.

M. *Daviel* relates that a caries happened to a man, in conſequence of a blow received on the crown of the head, ſeveral years before. There remained in the part a pain, which ſomewhat abated for a while, but afterwards returned with great violence. There appeared on the part of the wound a tumor, as large as a hen's egg, which being opened diſcharged a large quantity of bloody and fetid pus. M. *Daviel* being called, extended the inciſion, and diſcovered a caries, as large as the palm of the hand, and in the middle of this caries an

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hole as large as a crown-piece. He tried ſeveral ways to extirpate this caries, but could only ſucceed by the trepan, which he firſt applied to the part where the patient felt his greateſt pain. This ſingle trepan was ſo far from being ſufficient, that he was obliged to apply ſeven others to the circumference of the caries, in order to remove all the carious part of the bone. The pain did not ceaſe till after a total exfoliation of the bone, at the circumference of the aperture: This exfoliation was made five weeks after the operation. The large aperture was gradually filled up by fleſh, which grew extremely faſt, and the lips of the wound were ſpeedily re-united, notwithſtanding which, the cicatrix was formed with difficulty, but in every other reſpect the ſucceſs of this operation was very happy. The members of the academy have ſince ſeen this man in *Paris*.

IX. Obſervation, by M. *Soulier*, on a caries of the *cranium*.

There are certain carious caſes, wherein we cannot confine ourſelves to the application of the trepan, ſince ſometimes the caries ſpreads and extends itſelf ſo irregularly, that we are obliged to employ different means, in order to remove the carious pieces of bones. A man, about fifty years old, and of a robuſt ſanguine conſtitution, had a continual fever with redoublements, and a violent pain in the head, eſpecially in the upper part. This fever terminated at the end of twenty-five or thirty days, but the head-ach, inſtead of being diminiſhed, increaſed, and became ſo violent every evening, that the patient deſired that an aperture ſhould be made in his head, in order to diſcover the cauſe of it. The periodical returns of this augmentation of pain every evening directed a recourſe to *Peruvian* bark and narcotics; but theſe remedies afforded no relief to the patient. There was obſerved on the crown of the head a kind of oedema, of about four inches

in

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in extent; reſolvents were applied to this tumor, and the patient was frequently blooded and purged. He was alſo ordered to take alterative broths, and aperient ptiſans, but all theſe remedies produced no effect. M. *Soulier* being called, and examining the part, found, in the middle of the oedema, an induration, as large as an almond, which made him ſuſpect an extravaſation in that part. This determined him to open the tumor, but as the patient was afraid of the knife, he contented himſelf with applying the potential cautery to the induration; and upon penetrating the eſchar, pus immediately iſſued; which induced M. *Soulier* to extend the inciſion farther than the eſchar. He introduced his little finger, and found that the bottom of the abſceſs extended to the bone, in which he felt a ſmall cavity, produced by a caries, and capable of containing the half of a pea. Obſerving that pus was diſcharged, as it were, by the pulſation of arteries, he imagined that this pus proceeded from under the *cranium*. In order to be aſſured of this, he deſired the patient to hold his breath, upon which the pus was diſcharged more copiouſly than before; which determined M. *Soulier* to make a crucial inciſion, which he filled with dry lint. Next day there was a conſultation, in which it was concluded neceſſary to apply one crown of the trepan, near the ſmall cavity before-mentioned. But M. *Soulier* had hardly begun the operation, when that portion of the external table which was contained in the crown of the trepan was ſeparated, and the pus was more copiouſly diſcharged. The ſecond table was ſo carious and rotten, that the probe eaſily penetrated it as far as the *dura mater*. M. *Soulier* perceived that the caries of the ſecond table was more extenſive than the aperture made in the external table, by the crown of the trepan. He extended the crucial inciſion, and next day applied a ſecond trepan in a

part

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part where the bone ſeemed ſound enough to bear the operation. The membranes of the brain, and even the ſurface of that organ, were corroded and impoſthumated for the ſpace of two inches. He then, by means of the gouge, the chiſſel, and the leaden mallet, removed more than four finger-breadths of the firſt table of the parietal, which uncovered the whole extent of the caries of the ſecond. Happily this caries had not quite penetrated the bone, oppoſite to the longitudinal ſinus. All this caries was removed, ſo that the aperture of the *cranium* was about five inches long, and four broad. M. *Soulier* then made it his buſineſs to rectify the bad ſtate of the membranes and ſurface of the brain. The exfoliation was ſpeedily made, the aperture in the *cranium* was filled up at the end of four months, and ſoon after the wound was perfectly cicatrized.

X. Obſervation, by M. *de la Peyronie*, wherein almoſt the whole frontal bone was removed, on account of a caries.

M. *de la Peyronie* has given the hiſtory of a caries ſtill more conſiderable. It poſſeſſed not only all that part of the coronal which forms the forehead, and that which contributes to form the orbits, but it had alſo reached the *os ethmoides*, of which it had deſtroyed that part which pertains to the orbit, and which is called the *os planum:* Beſides, one of the temporal bones was conſiderably affected by it. The patient, who was a ſtranger, had in vain had recourſe to the moſt celebrated phyſicians and ſurgeons of his own nation, for which reaſon he came to *Montpellier* for relief, and applied to M. *de la Peyronie*, who determined to remove the caries. But in removing the ſkin of the forehead and temples, he took care to leave a portion from the top of the forehead to the root of the noſe, in the form of a band, that the ſkin of the face might not be intirely ſeparated from that of the crown of the head, and that this portion might, by its ſides, concur to the production

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tion of the cicatrices that were to repair the ſkin which it was neceſſary to remove. M. *de la Peyronie*, for this purpoſe, uſed cauſtics, and, after having laid bare the caries in the manner he had projected, he perceived that the firſt table of the coronal bone formed a ſmooth arch, with many holes, thro' which he could touch ſome pieces of the bone of the ſecond table, ſome of which were looſe, and partly detached. He removed the firſt table; and the pieces of bone, which then appeared bare, had acquired a very conſiderable bulk, and ſuch a degree of hardneſs, as to render them proof againſt inſtruments of the beſt ſteel. It was neceſſary with all expedition to diſencumber the *dura mater*, which was compreſſed by theſe pieces of bones, and irritated by their irregularities and points: Trepans, elevators, forcipes, ſaws, files, terebras, leaden mallets, gouges, and almoſt all kinds of cizars, were employed in this operation; ſo that an uncommon courage was requiſite in the patient. Almoſt the whole coronal was removed: Some points or elevations, which were leaſt injured, were, however, ſpared, in order to ſuſtain the cicatrices, and to diminiſh the deformity of them, which muſt have otherwiſe been very great after ſuch an aperture, for he was even obliged to remove ſome part of the bone at the root of the noſe. In order to deſtroy the reſt of the caries, he had recourſe to the eſſence of clove-gilly-flowers, euphorbium, the exfoliating medicines, and even fire. The exfoliation was made in about two months, on which occaſion ſome granulations of new fleſh began to appear, but a large quantity of viſcid, crude, and apparently corroſive humidities greatly retarded the growth of this new fleſh.

M. *de la Peyronie* dreſſed this wound twice a day with the remedies uſed in ſimilar caſes. This method did not ſucceed as he could

Dreſſing of the wound.

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could wiſh, againſt the corrupted moiſture, which retarded the cure, ſo that he had recourſe to a kind of ablution, or waſhing, which he repeated thrice a day, for half an hour each time, ſometimes with the waters of *Balaruc*, and at others with other vulnerary liquors. The changes produced by this new method of dreſſing were ſo ſpeedy and advantageous, that he determined to ſend the patient to the waters of *Balaruc*, rhat he might have the remedy in all its force, in order to deterge more effectually, and make the cicatrix advance more ſpeedily. M. *de la Peyronie* ordered him to be dreſſed three or four times a day, by pumping on the diſeaſed part for half an hour each time, taking care that the fall of water ſhould conſtantly cover the wound, ſo that, tho' it had nothing upon it, it received no injury from the air during theſe long dreſſings. This practice ſucceeded ſo happily, that in twenty days the wound was almoſt cloſed up.

A ſucceſs ſo happy and deciſive ought to baniſh all thoſe reflections with which either timidity or prejudice can inſpire us againſt theſe ablutions. Skilful ſurgeons, who are inſtructed by this experiment, and attentive to the indications preſented by diſeaſes which ought to be thus treated, will eaſily perceive the advantages of ſo ſalutary a method: We could, if it were neceſſary, here relate another cure, which M. *de la Peyronie* managed almoſt in the ſame manner; but we ſhall only obſerve, that when the waters of *Balaruc* cannot be had, the ſame ſurgeon, with great ſucceſs, employ'd a lixivium of the aſhes of broom-twigs, or even of the aſhes of common freſh wood, in conjunction with pumping on the wound, when the patient is capable of bearing it.

This obſervation, which furniſhes us with one of the moſt important facts in ſurgery, as well for the violence of the diſorder, and the courage of the patient,

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patient, as for the prudence and intrepidity of the ſurgeon, is one of thoſe extraordinary inſtances of the reſpect due to humanity, which, in deſperate caſes, has induced great ſurgeons to thoſe bold undertakings, that ſerve to diſcover more and more the force of nature, and the various reſources of art, which it is certainly of great importance to know; ſince for want of being acquainted with thoſe prodigies of nature and art, we often believe theſe diſeaſes incurable which are not really ſo. Thus *Benevenius* * informs us that in a certain man, a caries deſtroy'd almoſt all the frontal bone, without injuring the ſkin. No body durſt undertake the cure: If, however, as in the preceding caſe, ſome ſurgeon had been ſkilful and intrepid enough to perform the operations capable of removing this terrible caries, the patient's life might have been preſerved, ſince he had ſtrength enough to ſtruggle with his diſorder for ſeveral years after he was abandoned by the ſurgeons.

CASE IV.

ALL theſe obſervations gave riſe in the academy to a queſtion which is of great uſe in practice, namely, how apertures of the *cranium* are cloſed, and what are the different means which nature generally uſes in order to produce a new ſubſtance, according as theſe apertures are greater or leſs. Meſſieurs *Fagel* and *Morand* preſented to the academy *craniums* of perſons which had been cured of the trepan a long time before their death. It was found that the apertures made by the trepan were nearly cloſed by an oſſeous reproduction, and what remained by a more tender ſubſtance, which being deſtroyed had left a ſmall hole in the middle of that reproduction. M. *Malaval* informs us that M. *Duvernay* ſhewed, in

How apertures of the *cranium* are cloſed up.

* Benet. biblioth. de chir. cent. 11. obſ. 86.

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in the royal garden, a *cranium*, in which the aperture of the trepan was closed up by a hard excrescence which had been supplied by the *dura mater*, and which in dissecting was separated from the *cranium*, so that the hole made by the trepan was intirely open, and in its primitive form. This stopple was callous, and its external surface, in appearance and consistence, resembled a budding horn; so that it was a substance very different from that of the bone, and also from that of the *dura mater*, of which, however, it was a production. Apertures of the *cranium* have been sometimes closed up by a pretty firm and solid matter, arising from the substance of the brain itself. *Fabricius Hildanus* * relates an example of this in the thirty-eighth observation, communicated by M. *Marechal*. The external flesh reached that which arose from the *dura mater*, and both concurr'd in closing the aperture made by three trepans, and at last became very hard. M. *Robault* thinks that, in similar cases, the flesh furnished by the *dura mater* unites with a similar flesh arising from the diploë, for closing the aperture made by the trepan. The great aperture, mentioned by M. *Sarrau*, and occasioned by the removal of the whole parietal bone, was closed up principally by flesh, which was furnished by the *dura mater*, and at last became firm enough to defend the brain. We find, in the observation quoted from *Raygerius*, that, to supply the loss of a great part of the parietal bone, he applied a plate of silver full of holes, thro' which the flesh passed, and joined above the plate, which was inclosed by it. *Raygerius* informs us that a person might feel the plate, and its holes, by putting his finger on the cicatrix. We must necessarily doubt of this fact, since it is so astonishing, that the author ought to have had it well attested before he related it. *Borelli* informs us that he saw the hole of a trepan, made

* Cent. 2. obs. 13.

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made by *John the Jew*, a celebrated ſurgeon of *Paris*, which was not filled up. This aperture was only covered with a very ſlender ſkin, thro' which the pulſation of the brain might be felt, tho' the operation had been perform'd eight years before.

When conſiderable apertures are not cloſed up by a cicatrix, ſufficiently firm to reſiſt the force of the brain, we are obliged to ſupply this defect, in order to prevent the ſymptoms which might otherwiſe appear.

XI. Obſervation, by M. *Marechal*, on a bandage to ſupport too weak a cicatrix of the *cranium*.

M. *Marechal* informs us that a man, cured of a large wound of the head, in which he loſt a ſmall portion of the *cranium*, was from time to time ſeiz'd with convulſions, in which he loſt his ſenſes. He ſuſpected that theſe ſymptoms proceeded from a ſuffocation of the meninges, which were diſtended by the brain, in the part where the *cranium* had been opened, ſo that there was a kind of hernia in the ſaid part. To ſupply this defect, M. *Marechal* made a ſort of bandage, or truſs, with a cuſhion, to preſs upon the cicatrix, by which means the convulſions and their conſequences were for ever removed.

This ſymptom appears much leſs frequently when the apertures of the *cranium* have been conſiderable, than when they are ſmall. For whilſt the *cranium* is open in wounds of the head, the inflation of the *dura mater* does not readily happen when the aperture is very large; and if we apply any thing after the wound is cured, in order to ſupply the defect of the bone, it is only with an intention to defend the brain, while the cicatrix of ſuch large apertures is as yet weak. M. *Soulier*, who, as we have ſeen in the ninth obſervation, had removed a part of the parietal, order'd the patient to wear a ſlender ſilver cap under his wig, in order to defend the

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the cicatrix. M. *de la Peyronie*, in the eleventh obſervation, informs us that a patient, whoſe cicatrix had deſtroy'd the *os frontis*, alſo uſed a plate of ſilver to defend the cicatrix; but perceiving that the plate galled him too much, he preferr'd a cap made partly of paſte-board, and partly of leather, which ſucceeded much better. We alſo find in *Paré* * that a man, who had a large portion of the parietal removed by a caries, occaſioned by a blow on the head, wore a leather cap to defend the brain, till the cicatrix was become firm enough to ſecure it.

* Lib. x. cap. 22.

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MEMOIR IV. *By M.* DU FOUART, *Surgeon of the Hoſpital of* Bicêtre.

On an enormous tumor: In which it is attempted, by various experiments, to determine the nature of the humours of which that tumor was formed, and the remedies which might have reſolved it.

CASE I.

THE patient, whoſe thigh I preſented to the academy ſome time ago, was a man of about thirty years of age, who, on the 12th of *September* 1740, ordered himſelf to be brought to the hoſpital of *Bicêtre*, expecting ſome remedy for an enormous tumor, which proved mortal to him. Deſcription of the tumor.

Upon examining the affected thigh, I found it to be two feet in circumference, ſo that it was at leaſt as large again as the other.

The ſkin, which appeared equally ſmooth in all its circumference, ſeemed alſo to make an equal reſiſtance every where; but I obſerved ſome gentle depreſſions, the largeſt of which was not above three lines in diameter. In theſe depreſſions I perceived the fluctuation of a matter very near the ſurface, and which I afterwards diſcovered to be diſcharged from ſmall puſtules in the centers of thoſe depreſſions, which being open at the tops, gave vent, through an almoſt imperceptible hole, to the liquid contained in thoſe parts where I had felt the fluctuation. The liquor diſcharged from theſe puſtules was extremely limpid, and of a reddiſh colour.

This is all I obſerved with reſpect to the external appearance of the tumor, except one circumſtance, which ought not to be forgot, and which is, that

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the whole ſkin was covered with a vaſt number of varicoſe veins.

I aſked ſeveral queſtions of the patient, in order to diſcover the cauſe of the diſorder. He told me that in the middle of a journey of two hundred leagues, he had felt ſo violent a pain in the left thigh near the greater trochanter, that he was obliged to ſtop in the inn for ſix weeks, without any aſſiſtance from a ſurgeon.

He added, that perceiving ſome relief, though ſtill ſuffering a great deal, he reſumed his road, and arrived at home with the ſame pains, which, from his out-ſetting, always perſiſted in the ſame degree, till the month of *October* 1739; during which time, which makes a year, he perceived neither any inflation nor change of colour in the ſkin; but that the pain being ſince as violent and intenſe as during the firſt ſix weeks, there was formed at the greater trochanter, a tumor, which, from its firſt appearance, had never ceaſed to augment.

This was all I could learn from the patient; in vain I carried my reſearches farther, neither did I find the ſmalleſt ſign of the pox, the ſcrophula, or the ſcurvy.

The patient in this ſtate could ſtill walk, notwithſtanding his violent pain. But every time he preſſed his heel on the ground, the pain became ſo violent that he forthwith fell into a ſyncope.

The tumor, by its daily augmentations, ſoon became ſo conſiderable, that the patient could no longer walk, and continued to increaſe by a ſenſible progreſs, till *February* 8, when he died.

During the laſt fifteen days, there ooſed, in the form of dew, an extremely clear water, from the whole ſurface of the tumor, whoſe circumference was at that time three feet; and the weight, including that of the thigh, was forty-one pound and an half.

Meſſ.

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Meſſ. *Gramont*, *Sorbier*, and *Hevin*, were preſent at the diſſection which I made of it. I found that the tumor was divided into three cyſtiſes, or bags; the firſt and moſt conſiderable of which occupied all the fore part of the thigh under the crural, the *gracilis anterior*, and the two *vaſti* muſcles, all of which were extenuated, without however being confounded with the tumor.

Diſſection of the tumor.

State of the muſcles of the part.

The ſecond cyſtis, or bag, was no more than the propagation of the tumor, which was continued under the *femoralis major*, and the *faſcia lata*, paſſed afterwards through the hollow of the thigh, and entered into the baſon, where it formed various eminences or prolongations, full of an humour which was more or leſs thick and like a jelly.

The third cyſtis extended all along the interior and poſterior part of the thigh, and joined the ſecond towards the tuberoſity of the ſchium.

I removed the two laſt parts in order to penetrate more eaſily to the center of the tumor, and ſeparated the thigh from the *oſſa ilea*. The articulation was in a good ſtate, the head of the thigh bone, and the *ligamentum rotundum* were no greater than ordinary, but the bone was fractured two inches below the little trochanter.

It is natural to think that the pain was firſt felt in that part, or that it was preciſely the place where the morbific cauſe, whoſe progreſs afterwards extended itſelf ſo far, firſt diſcovered itſelf.

I ought not to omit two circumſtances which I diſcovered in the diſſection, and the ſingularity of which ſeems to merit the attention of the reader.

The firſt of theſe circumſtances is, that the tumor had its ſeat in the perioſteum alone, ſince its external ſurface was preciſely the external ſurface of that membrane; for the band of muſcles

It had its ſeat in the ſubſtance of the perioſteum.

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implanted in the femur, or thigh-bone, were ſeen bare on the out-ſide of the tumor, ſo that the ſurface of the perioſteum, and the band of muſcles, which were raiſed together by the humours that formed this heap of matter, were diſtant from the body of the bone, by the whole thickneſs of the tumor.

A ſolid, and, as it were, bony concretion at the center of the tumor.

The ſecond circumſtance relates to a bony concretion, or rather a white and friable matter, which I found in the middle of the tumor. This did not in the leaſt adhere to the bone, from which it was ſeparated by the fleſh, or ſubſtance of the tumor, which covered and ſurrounded it every where equally. What is principally to be obſerved in this concretion is, that the ſtrata of the matter which forms it, are not a compoſition truly ſolid, ſince the parts of them are very friable, and may be ſeparated almoſt as eaſily as the parts of a calcined bone. They do not even produce an uniform and continued maſs, ſince they are ſeparated from each other by an infinity of pores, or very ſenſible interſtices. In a word, they do not form an organic whole, ſince they only conſtitute a congeries of irregular laminæ, ſuch as congeſtion might have thrown together, without veſſels, without intermediate fibres, without connection, order or regularity: In ſhort, they are only juices ſo inſpiſſated as to aſſume an apparently bony conſiſtence, and theſe juices being at firſt poured from the open mouths of the veſſels deſtined for their conveyance, have afterwards united by the ſingle obſtacle they found to their diffuſion, and have thus formed an irregular aſſemblage, which has no other form than what was preſcribed to it, by the greater or leſs reſiſtance

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which the ſubſtance of the tumor has oppoſed to the extravaſation of thoſe ſame humours.

CASE II.

THIS is almoſt all I could obſerve, either by the external appearance, or by the diſſection of the tumor. It is not neceſſary that I ſhould enter into a detail of the remedies I uſed for the relief of the patient, ſo that I proceed to the firſt experiment I made, in order to diſcover the ſpecies and character of the humour which formed this tumor.

Experiments to diſcover the nature of the humours of the tumor.

I firſt took a ſlice of the tumor, and threw it into hot water, and though this portion was before ſmooth, ſoft, and little elaſtic, yet I immediately after drew it out of the water, grumous, or rather granulated, in all its ſurface; hard, and horny in its ſubſtance, and almoſt as elaſtic as bend leather.

Experiments by the action of fire, which diſcover gelatinous juices.

This effect of the hot water on the tumor ſeems evidently to repreſent the character of albuminous juices, that is, of lymph, which, we know, is hardened by the fire, as well as the white of an egg. However, as at the firſt glance of the eye this tumor appeared to be of the pinguious kind, and as I had often ſeen true fat become harder by being thrown into boiling water, ſurpriſed as it were by the heat, I expreſſed the juice of the tumor, in order to obſerve the effect of hot water upon it. If it ſhould be fuſed, I muſt neceſſarily diſcover the nature of pinguious juices, or at leaſt the nature of juices very different from the lymphatic. If, on the contrary, it ſhould harden, this proof, joined to the former, muſt ſhow me the cha-

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racter of a lymphatic juice. The ſucceſs of my experiment was as follows.

Experiment by the action of fire, which diſcovers lymph in the tumor.

The expreſs'd juice, which had the conſiſtence of a pretty thick jelly, far from being hardened in hot water, was totally fuſed in it, and mixed ſo well with it, that it rendered it all equally turbid, without my being able to diſcover any fat floating on its ſurface.*

Hence we may conclude, that theſe juices muſt be of a lymphatic nature, according to my firſt obſervation. Beſides, they were perfectly mixed with the water, and no fat appeared to float on the ſurfaces; whence we may moreover obſerve that they muſt be pinguious. Then I could not avoid diſcovering the true character of gelatinous juices, whoſe property it is to aſſume the conſiſtence of a jelly by cold, to be fuſed by heat, and to mix with water.

I had now got an inſight into the nature of thoſe juices, by help of all theſe marks; it however remained for me to inveſtigate, why the firſt experiment preſented me with no other phenomenon, than the induration of that part of the tumor which I threw into the water, when at the ſame time the property of gelatinous juices is to be fuſed by heat. Not being able to doubt after the experiments I had made, but theſe laſt juices conſtituted the predominant part of the tumor, I concluded, that

* M. *Bouquet* has alſo communicated an obſervation of an enormous tumor, which poſſeſſed all the thigh. He threw ſlices of this tumor into boiling water, which hardened them. This made him think, that the juices of this tumor were entirely lymphatic. Theſe juices were ſo inſpiſſated, that they could not be expreſſed, to try them alone by the heat of boiling water. The different kinds of experiments made here, and which have diſcovered a great deal of gelatinous juices, make us ſuſpect that the tumor, mentioned by M. *Bouquet*, was entirely formed of lymphatic juices, for it appears to be of the ſame nature with that deſcribed here. The academy deſires thoſe who have an opportunity of ſeeing ſimilar tumors, to make the experiments here ſpecified, and others, in order to be aſſured whether all theſe tumors are formed by the ſame kind of juices.

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that if the heat of the fire had not fuſed them, it was only becauſe I had miſapplied its action. Returning therefore to my firſt tryal, I imagined that the firſt ſhock of the heat might have indurated the veſſels, and even the albuminous juices, and by this means have impriſoned, if I may ſo ſay, the gelatinous juices, and ſo prevented their flowing, notwithſtanding their fuſion; whence I preſumed, that by puſhing the heat farther, the gelatinous juices being fuſed and rarefied, might, by their expanſion, break through the veſſels and albuminous juices, and thus make a vent for themſelves. Theſe conjectures were confirmed by experience: I took a portion of the ſame tumor, and put it in a ſtove, over a very clear and briſk fire; after crackling for ſome inſtants, this part of the tumor was almoſt entirely fuſed, upon which I took out the juice, which in cooling aſſumed the conſiſtence of a true jelly.

What I had done by ſubjecting the part of the tumor to the fire, without the intervention of water, I thought I could alſo effect by water, provided I employed a longer continued heat. I was not deceived in my opinion; for a portion of the tumor, after being indurated in the water, as at the firſt tryal, afterwards became ſoft, diminiſhed gradually, and at laſt, after two hours boiling, yielded a juice, which gave the water ſo gelatinous a character, that a few moments after it was taken off the fire, it aſſumed the conſiſtence of a glue, more than moderately thick.

I warmed and cooled theſe two matters frequently, as well that obtained by the ſtove, as that procured by the ebullition. The heat always fuſed them, and the cold always inſpiſſated them in form of a jelly; with this difference, however, that the jelly obtained by the boiling in hot water, was more ſtrong, glutinous, adheſive, and elaſtic, than

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that which I extracted by the ſtove. It appeared unneceſſary, after all theſe experiments, to enquire farther into the character of the gelatinous juices which formed this tumor. However, I was willing to try whether by the ſalts, which are known to be proper to theſe juices, they ſtill ſuſtained their character.

A ſurgeon, who has not neglected the improvements which medicine can impart to our art, has demonſtrated, that the gelatinous juices are impregnated with all the eſſential ſalt of the chyle, that this ſalt is truly aceſcent, that boiling even changes its nature ſo little that on the firſt ſpontaneous motion it becomes highly acid, as we ſee in broth, which is nothing elſe than water impregnated with the gelatinous juices extracted by ebullition. Conducted by theſe diſcoveries, for which I was indebted to the works of that author, I fuſed a certain quantity of the jelly. I mixed one part of it with ſyrup of violets, another I poured upon blue paper, and the remainder I put into an untinned and very clean copper veſſel. The ſyrup of violets had its colour changed, the blue paper became red, and the copper in leſs than twenty-four hours was covered with verdigreaſe, which fell off in flakes or ſcales. By theſe effects, which are proper to acid ſalts, it was impoſſible not to diſcover the nature of the juices which were impregnated with them. I was therefore no longer dubious with reſpect to this affair, ſince the aſſemblage of all the phenomena, the fuſion by the heat, the inſpiſſation by the cold, the diſſolution of the copper by the ſalts, the change of colour in the ſyrup of violets, and of the blue paper by the ſame ſalts, concurr'd to furniſh me with the moſt evident proofs.

Though I had no longer any doubt with reſpect to this point, yet I doubted very much concerning another

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another, in which I thought it equally important to be ſatisfied. You may remember that, in the firſt trial, the induration had made me ſuſpect a lymphatic character in the juices, but in the laſt trials, no phenomena had favoured the exiſtence of ſuch juices. Far from being indurated by the fire, they were fuſed by it, as I have often ſaid; and in cooling, I neither obſerved any ſediment, nor any of thoſe filamentous concretions obſerved in the water in which the blood has been received from the arm or the foot. But then, were theſe negative proofs deciſive enough, think you, to conclude againſt the preſence of a lymphatic juice in the tumor? I did not think ſo, and thought I had good reaſon, not only from the firſt experiment, which ſeemed to favour the exiſtence of this juice, but alſo from another circumſtance, which was only mentioned by the bye, but ought to be remembered here, which is, that the juices extracted from the tumor, eſpecially thoſe obtain'd by boiling, aſſumed in cooling a conſiſtence, coheſion, and tenacity, which are not to be obſerv'd in the ſtrongeſt jellies. Now to what can we attribute this extraordinary tenacity and conſiſtence, if not to the lymphatic parts mixed with theſe juices? At leaſt this was what I imagin'd, neither was I ſurpriſed, that the jelly obtain'd by the boiling in hot water, was much ſtronger than that extracted by the ſtove, becauſe it is evident that the hot water, by gradually macerating the portion of the tumor, muſt have carried off a pretty large quantity of the fibrous or lymphatic parts; whereas, on the contrary, the violent heat of the ſtove muſt have at firſt indurated theſe laſt juices, ſo that the gelatinous juices in their fuſion could only carry off a very ſmall quantity of them.

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These ideas were not without foundation, but still I wanted to be absolutely certain, to discover the substance of the lymph in itself, and to separate it, if possible, from the other juices with which it was blended, in order afterwards to make, upon this separate humour, the experiments which might best ascertain its nature. I determin'd, therefore, to pour upon the fused jelly, such substances as I knew were proper to fix and inspissate the lymph. I successively employ'd spirit of vitriol, spirit of wine, and volatile salt of vipers. My attempts were followed with the success I hoped: The spirit of vitriol precipitated a *coagulum*, which equall'd about the sixth part of the whole liquor, and whose consistence was glairous, and but little tenacious. The spirit of wine, after exciting a great effervescence in the jelly, which its mixture seem'd to render milky, also precipitated a *coagulum*, like the vitriol, but much larger, stronger and more tenacious, than that which the acid mineral had afforded. The same effects were produced, but in a more remarkable manner, in the mixture of the salt of vipers with the juices of the tumor. The effervescence was at first extremely violent, the humours appeared to be inspissated and whiten'd much more than with the spirit of wine, and almost in a moment was form'd a *coagulum*, equal, or nearly equal, to the whole bulk of the mix'd liquors, but of so great a hardness and tenacity, that I could scarce thrust a needle into it, or pull it out again. By these phenomena I could not chuse but discover the existence of the lymph. These concretions, furnished by the mixtures of the spirit of vitriol, salt of vipers, and spirit of wine, evidently evinced the presence of the albuminous juice, whose property it is to be inspissated in the same degree as just observed by the experiment. It is thus that we perceive the fibrous parts of the blood,

Experiments by different mixtures, in order to discover the lymph.

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in a porringer, assume a moderate consistence with spirit of vitriol, and one somewhat stronger with spirit of wine, which is still much surpassed by that obtained by the salt of vipers. Tho' I might have contented myself with these experiments, I was not yet satisfied: The lymph had been sufficiently discovered by all these tryals, but it still appeared something singular, that this lymph, which constituted a good portion of the juices, should afford no filamentous concretion, such as that observed in the water in which venesection in the foot has been performed, in which, however, there is certainly a much smaller quantity of lymph.

It is true, I could not expect any of these concretions so long as the heat kept the gelatinous and lymphatic humours in fusion, for the same reason that we see no similar concretions in the water in which the foot has been blooded, so long as this water remains warm. But why did not this mixture of gelatinous and lymphatic juices permit in cooling, as well as the water, the approach and agglutination of the fibrous or albuminous parts, in order to form the whitish filaments observed in the water? I imagined, that, after some reflection, I had found out the true reason of this phenomenon. The fused jelly was hardly taken off the fire, before it resumed its gelatinous consistence; so that the lymphatic parts, pent up by those of the gelatinous kind, which were fixed, could by no means, notwithstanding their affinity, approach and unite, in order to form those lymphatic flakes observed in the water used for venesection in the foot. This reason to me appeared so plausible, that I thought I might expect the formation of these flakes, if I mix'd with the jelly a quantity of water sufficient to hinder it from resuming, at least for some time, its gelatinous consistence. Accordingly I fused a certain portion of the jelly in a cylindrical vessel, and pour'd double the quantity

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of cold water upon it, when immediately I had the pleaſure of ſeeing much more than I had expected; for the water was hardly mixed with the jelly, when the flakes were forthwith form'd, and ſubſided in the form of a thick ſnow.

I would fain have taken the lymph, which I had juſt ſeen ſeparated from the gelatinous juices, in order to make ſuch experiments on it, as might beſt aſcertain its nature. I therefore waited almoſt half an hour, with a deſign to decant the liquor, and afterwards take the lymphatic ſediment. But, inſtead of this operation, I was obliged to perform another. The juices, notwithſtanding the large quantity of water I mixed with them, became fixed a ſecond time, and reſumed the conſiſtence of a jelly, which did not hinder me from ſeparating the whitiſh and opaque ſediment that was ſeen at the bottom thro' the jelly, which was every where very clear and pellucid, except towards the bottom. Having ſeparated this ſediment, which was as yet much impregnated with gelatinous juices, I fuſed theſe juices by the heat of my hands in handling the lymphatic flakes, by which means I obtained a pure lymph, on which I made the following experiments. I put it in ſpirit of wine, which hardened it extremely; then I expoſed it to the fire, which, far from fuſing it, at firſt ſhrivell'd it up, and then calcined it.

All theſe experiments demonſtrated the exiſtence of the lymph, and its mixture with the gelatinous juices, ſo that nothing was wanting to compleat my wiſhes, but to determine, as nearly as might be, in what proportion theſe juices were mixed. But a part of the experiments, I had before made, ſeem'd ſufficient to decide that point.

The proportion in which the gelatinous and lymphatic juices were found in this tumor.

The part of the tumor which I had expoſed to the fire, in the ſtove, was much diminiſhed; but this

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this diminution, however great, amounted at moſt to no more than four fifths of its weight and bulk, ſo that what remain'd in the ſtove made a good fifth of the whole ſubſtance on which I had tried the experiment. Now, certainly, this remainder was nothing more than the concretion of the lymphatic juices, excepting always the veſſels of the perioſteum, which cannot come into the account, as being but an inconſiderable portion of thoſe which compoſe that very fine membrane. We may, therefore, affirm that in this remainder there was at leaſt a fifth of lymphatic humours. But again, on the other hand, the gelatinous juice fuſed in the ſtove had certainly carried off a part of the lymph, ſo that there was more than a fifth of this humour in the juices which form'd the tumor.

The remainder, left by the boiling in the water, join'd to the ſediment obtained by means of cold water from the jelly extracted by the ſame boiling, furniſhed me with a ſtill more accurate calculation. The remainder of the boiling, indeed, was no more than a ſixth part, but the other ſediment, which I ſpoke of, amounted to an almoſt equal quantity, ſince it occupied nearly two lines in the cylindrical veſſel, into which I had only put about an inch of the fuſed jelly. It is true that this ſediment was not intirely lymphatic, but it is alſo probable that much of the lymph was not precipitated by the mixture of the cold water; for it is very probable that a large portion of this humour, intimately mixed with the gelatinous juice, had remained ſuſpended in it. Due allowance therefore being made, by taking the lymphatic ſediment nearly for a ſixth, including the part of that albuminous humour, which remained among the gelatinous juice, and by adding this quantity to the remainder of the boiling, which I alſo ſaid equall'd about a ſixth, we ſhall find that the lymphatic juices amounted almoſt to a third of the

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the juices of the whole tumor; ſo that we may affirm, at leaſt without fear of any material error, that it conſiſted of two thirds of gelatinous, and one third of lymphatic juices.

Remarks on theſe experiments.

Before we proceed to the experiments I afterwards made, in order to diſcover the ſubſtances which would have been moſt proper for the reſolution of the tumor, I ſhall make ſome reflections on thoſe of which I have already given the detail. It is eaſily obvious that if we had confined ourſelves to the firſt experiment, that is, to the induration of one part of the tumor by boiling water, or to the reſult of mixing ſalt of vipers with the juice of the tumor, theſe two experiments evincing only the exiſtence of lymph, we ſhould not have diſcovered any other humour in the tumor. We may make the ſame remark on thoſe experiments which diſcovered the gelatinous juices, that is, on the fuſion of the humours extracted by heat, and on their concretion in form of a jelly by means of the cold. We may aſſure the reader, that if we had begun with this laſt experiment, and neglected the firſt, we ſhould have imagined that the gelatinous juice alone had form'd this tumor, notwithſtanding which, we ſee how important it was to diſcover the different juices of which it was really compoſed. Hence we may eaſily conclude, how eſſential it is, when we want to penetrate into the true conſtitution of mixed ſubſtances, to multiply tryals, and not to content ourſelves with ſingle experiments, which, inſtead of enabling us to diſcover truth, often tend to plunge us into error, eſpecially ſince what they diſcover, or ſeem to diſcover to us, is always a mixture of truth and error.

The ſecond remark we ſhall make is, that our experiments, notwithſtanding their firſt appearances, aſcertain the diſtinctive characters of the gelatinous and lymphatic juices; for if the gelatinous juices did

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did not discover themselves by their fusion, when we only threw a piece of the tumor into boiling water; and if, on the other hand, no lymphatic concretion evinced the presence of an albuminous juice, either in the fusion of the expressed juices, or in their concretion in form of a jelly, we must have been obliged to recur to foreign circumstances, which might have prevented these effects, since they were afterwards perfectly obtained as soon as such circumstances ceased. When we separated the lymphatic parts from the gelatinous juices which kept them divided, they reunited again, assum'd a filamentous form, and were indurated by the fire. In like manner, when we removed the obstacles to the gelatinous juices, form'd by the induration of the lymphatic, we observ'd that the former were fused, and immediately flow'd; so that our experiments, far from weakening the character assign'd to these juices, confirm it in a manner the least equivocal. I now proceed to the experiments I made, in order to discover the remedies, by means of which the resolution of this tumor might have been most probably obtained.

CASE III.

IT was natural to think that the remedies capable of keeping the gelatinous juices in fusion, and fusing them when they were fix'd into a jelly, were most proper for resolving this tumor. I made it my business then to discover these remedies, but before I made my first tryals on the expressed juices, I was willing to see what effect simple hot water would produce on a part of the tumor which remained. I therefore threw this piece into water some degrees warmer than its natural heat (that is, as hot as the hand can easily bear it) which was sufficient to fuse the gelatinous, without indurating the lymphatic juices.

Tryal by heat.

I kept

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I kept the water in the ſame heat for eight hours, during which time the part of the tumor loſt near a tenth part of its weight. This effect is the more remarkable, becauſe the parts of the water, with which the portion of the tumor was impregnated, might alſo make a conſiderable part of the remaining weight. This firſt experiment was ſucceeded by one made with ſuch ſubſtances as appeared capable of keeping the expreſſed juices in fuſion. I had no hopes of expecting this effect, either from ſpirit of vitriol, or that of wine, and ſtill leſs from the ſalt of vipers. You may remember that theſe ſubſtances had precipitated a *coagulum* more or leſs conſiderable; but I muſt add that the remainder of theſe precipitations had not leſs aſſumed the conſiſtence of a jelly, except that obtain'd by the mixture of the ſalt of vipers with the juices of the tumor; for this remainder, which was in a very ſmall quantity, continued always very liquid and clear. But this exception is ſo far from proving the reſolvent virtue of this ſalt, that the circumſtances of the experiment demonſtrate that the preſent phenomenon can only be aſcribed to its inſpiſſating force. It is to be remember'd that the *coagulum* form'd by it, almoſt equall'd the bulk of the matter on which the experiment was made, and that the hardneſs of this *coagulum* ſcarce yielded to that of horn. It is not improbable that ſome aqueous parts might have been expreſſed from it by the force of the coagulation, and that theſe, being thus ſeparated from the other parts ſuſceptible of concretion, may have preſerved their liquidity; ſetting aſide then the ſubſtances I have now mention'd, I at firſt directed my views to vegetable acids, and then to neutral ſalts.

Tryals by various mixtures.

It was not without reaſon that I preferr'd theſe ſubſtances to the other. The fuſing and reſolvent virtue of ſal-ammoniac, atteſted by ſo many happy cures in the common practice

practice of ſurgery; and agreeably to the obſervations of M. *Queſnay*, the effects produced on the blood by aceſcent ſalts which are not bitter, acid ſalts of the vegetable kind, moſt neutral ſalts, and eſpecially ſal-ammoniac, in a great meaſure convinced me what I might expect from a mixture of ſubſtances. Having, therefore, fuſed a part of my jelly, I divided it into four portions, each of which I mixed, ſeparately, with an equal quantity of common vinegar, diſtill'd vinegar, ſyrup of violets, and ſal-ammoniac. The common effect of theſe three laſt liquors, was to maintain their reſpective portions of jelly in fuſion, and eſpecially the ſal-ammoniac preſerved it in a perfect liquidity, but the common vinegar did not hinder it from aſſuming a pretty ſtrong gelatinous conſiſtence. This ſo different effect of the common, from that of the diſtill'd vinegar, would have ſurpriſed me, if I had not obſerved that in making the experiment I had uſed recent vinegar, which was conſequently impregnated with ardent ſpirits, as was obvious from its vinous ſmell. It is evident that this liquor, on account of its inflammable ſpirit, muſt partake of the nature of ſpirit of wine, and conſequently produce thoſe effects whoſe ſimilarity denoted the preſence of the ſame principle.

The effect of theſe ſubſtances, which had kept the juices in fuſion, ſeemed to promiſe fair for their efficacy in the reſolution of tumors ſimilar to the preſent; and this prejudice in their favour would be much ſtronger, were theſe ſubſtances capable not only of maintaining the fluidity of the gelatinous juices when fuſed, but alſo of liquifying and fuſing them when they were fixed into a jelly. I was, therefore, impatient to try what effect a mixture of theſe ſubſtances would produce on the jelly itſelf. On the other hand, being curious to ſee what effects the former ſubſtances would produce on this jelly

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when not fuſed, which being mixed with the juices in fuſion had haſten'd the gelatinous concretion of them, I was eager to try the effects of the ſame ſubſtances on the juices when fixed. Having, therefore, divided all the jelly which was left, into as many portions as I had ſubſtances wherewith to make experiments, I mixed each, ſeparately, with a portion of the jelly I had thus divided. The mixture of the mineral acid, as alſo that of the ſpirit of wine, and of the ſalt of vipers, produced the effect which might have been naturally expected. If the ſpirit of vitriol did not indurate the jelly, ſo neither did it ſoften it, at leaſt in a ſenſible manner. The two other ſubſtances indurated it intirely, and this effect was principally obſerved in the jelly into which I had pour'd the ſalt of vipers. As to the other mixtures, they produced the following effects: The common vinegar and ſyrup of violets only ſoftened the jelly, whereas the diſtill'd vinegar and ſal-ammoniac fuſed it totally, with this difference, that the ſal-ammoniac inſtantaneouſly produced this effect, whereas the diſtill'd vinegar only did it gradually. It is alſo to be obſerv'd, that this acid did not give to the fuſed juices, a liquidity equal to that found in the jelly fuſed by the ſal-ammoniac.

I could have wiſh'd to have tried what would have been produced, on the fixed gelatinous juices, by the mixture of a great many other ſubſtances, ſuch as different neutral ſalts, ſaponaceous oils, camphire, decoctions, ſalts, or extracts of ſudorific woods, and eſpecially the juices of the *ſolanum lignoſum*, baum, feverfew, the roots of elicampane, briony, the *ſigillum mariæ*, the *corona imperialis*, and others, which the experiments made by the author we have quoted, ſeem to place in the rank of the diſſolving remedies we want, which are thought to be very numerous and well known, tho' they are far from being ſo. But having uſed all the jelly in

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in the preceding experiments, and not being able to extract any from the reſt of the tumor, which was putrified, all I could do, was to try common ſalt, and ſalt of ſuccory, which I had by me, not on the pure jelly, ſince I had none left, but on a portion of that limpid jelly, which I had obtain'd by a mixture of gelatinous juices with double the quantity of cold water, and which had been preſerved by chance. The effect of each of theſe ſalts was pretty ſpeedily to fuſe this clear jelly; but whether they would have produced the ſame effect on the pure jelly I cannot ſay, nor can hardly preſume to expect.

Such were my experiments, and I could wiſh to have carried them farther, if circumſtances would have permitted. I ſhall now draw ſuch conſequences as ſeem moſt naturally to ariſe from them.

Application of theſe experiments to practice.

1. The effects of the ardent ſpirit, and of the ſalt of vipers, evince that it was not from ſuch ſubſtances that we were to ſeek for remedies for the reſolution of this tumor; and if ſo many authors have celebrated theſe ſubſtances, as attenuants of ſovereign efficacy, this circumſtance only proves that they have conſulted their own imaginations more than experience.

2. If we could have efficaciouſly attempted the reſolution of the tumor, it muſt have principally been by a bath of warm water, ſtrongly impregnated with ſpirit of ſal-ammoniac, and whoſe action ought to have been ſeconded by general remedies, and eſpecially by purgatives ſeaſonably exhibited, with an intention to eliminate the matter of the reſolution.

3. We might have perhaps employ'd, with great advantage, plants furniſh'd with gently acid or aceſcent juices, eſpecially in rendering their action more efficacious by the addition of ſal-ammoniac, or even ſome other neutral ſalts.

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4. Among the different remedies which might have been employ'd whilſt the tumor was curable, ſal-ammoniac would have been of all others the beſt. The proof of what we advance, may be drawn from this, that this ſalt unites together two virtues, that of fuſing the juices inſpiſſated in the veſſels more effectually than the other ſubſtances, and that of powerfully exciting the action of the ſame veſſels. Theſe are advantages which we do not find in vegetable acids, which certainly by their aſtringent action weaken or retard the organic movement of the parts. So that tho' acids were as reſolvent with reſpect to the fluids, as ſal-ammoniac, yet this ſalt would ſtill have the preference, becauſe it excites the action of the veſſels, whereas acids check it by their aſtringency.

Tho' the reſolution of the tumor may poſſibly be attempted with ſucceſs by the remedies we have mention'd, we would not have it thought that on account of their experienced efficacy, we believe they may be uſed with advantage in the laſt ſtage, or time, of the tumor; for we are perſuaded, on the contrary, that the moſt powerfully fuſing or reſolvent medicines would be uſeleſs in ſuch a juncture.

Such, doubtleſs, was the weakneſs of the natural heat in the tumor, that the juices muſt neceſſarily have been inſpiſſated in them, or perhaps in ſome meaſure even fixed; but it is not this ſtate of the humours, in the laſt time of the tumor, that ſhould make us look on the application of all remedies as uſeleſs; it is the ſtate of the veſſels, in which the greatneſs of the obſtruction muſt almoſt totally deſtroy all organic motion, not to mention the mortal ſhock given to the vital principle, by the malignity of the juices, which ſo long a ſtagnation muſt reduce to an extreme depravation. But if, on the one hand, we are convinced that we ſhould have in vain attempted to reſtore life to the mortified veſſels;

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veſſels; and if, on the other, it is evident, as phyſiology teaches us, that it is only by the action of the veſſels, that ſtagnant juices can reſume their courſe, and fall in with the circulation, it would have been of no ſervice to attempt the fuſion of the inſpiſſated humours, when, by extinction of the organic motion of the veſſels, there was no longer any agent able to puſh them out of the place of their ſtagnation.

I have ſaid that the juices muſt have fallen into a great depravation; this is the natural conſequence of their long continuance in the tumor. But if it were aſked, what was the perverſion of each particular juice which form'd it, that is, of the gelatinous and lymphatic juices, we muſt, in order to reſolve this queſtion, have recourſe to the facts already mention'd. The reader will eaſily recollect, that the tumor was ſuppurated in many points, and that an ichorous ſuppuration had even render'd the bone intirely carious. Now certainly theſe ſuppurations were putrid, and could not fail to affect the lymph, ſince it is evident that the firſt and only ſpontaneous motion, of which it is ſuſceptible, is that of putrefaction. We know that this does not hold true of the gelatinous juices. But tho', by the character of the ſalts with which they are impregnated, they might have reſiſted a tendency to putrefaction, they muſt, however, have contracted that kind of depravation, which correſponds to the nature of aceſcent ſalts, that is, they muſt have fermented, at leaſt imperceptibly. The facts here evince what the knowledge of theory made probable. The gelatinous juice of the tumor made the blue paper red, and covered the copper with verdegreaſe, that is to ſay, it produced the effects which are conſtantly produced by diſengaged acids, ſuch as thoſe yielded by acid fermentations, but which are never

State of the depravation of the juices of the tumor.

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diſengaged by ſalts ſimply aceſcent, ſuch as thoſe of the gelatinous juices unfermented. Hence it follows, that in the preſent obſervation, fermentation muſt have given a very conſiderable character of acidity to the gelatinous juices of the tumor.

Why the ſtagnant juices have been long preſerv'd from putrefaction.

I believe, after theſe diſcoveries, the perverſion of the humours of the tumor is not to be called in queſtion. What is remarkable is, that the enormity of the obſtruction did not ſooner contract a putrefaction. But we know, that aceſcent ſalts, with which the gelatinous juices are impregnated, are naturally antiputrid, and become more ſo by the new degree of acidity, which fermentation gives them; to this we may add the air's being deprived of acceſs to the juices diſtributed and included in the texture of the tumor, and the little fluidity of theſe juices. It is not therefore ſurpriſing, that, ſince the gelatinous juices predominated in the tumor, they have preſerved it from putrefaction for ſo conſiderable a time.

Conjectures relating to practice.

What we have ſaid may authoriſe us to draw ſome conſequences, which we ſhall venture to do, not ſo much becauſe we believe them undoubtedly ſure, as becauſe they are intereſting in themſelves, and make us ſenſible at leaſt of the importance of thoſe obſervations, which may either verify the juſtneſs of them, or demonſtrate their falſity. We ſay then, that there ſeems to be ground for us to conclnde, from what was obſerved in the laſt place,

1. That among the tumors, formed by the congeſtion of white juices, thoſe which remain long without any change, tho' they are not ſcirrhous, are probably congeſtions like that mentioned in this reſearch, that is, they are principally formed of gelatinous juices.

2. That

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2. That if, among the congeſtions of white juices, there are ſome which aſſume a ſcirrhous character, theſe differ from the firſt, in that they ſeem to be principally formed, not of gelatinous, but of lymphatic juices; for the property of heat is to indurate the lymphatic humor, and, on the contrary, to preſerve the liquidity of the gelatinous juices by keeping them in fuſion; not to mention that theſe laſt juices are only at moſt ſuſceptible of a gelatinous, but not of a ſcirrhous concretion.

3. That as ſcirrhous concretions are only formed *for the moſt part* * in the glands, ſo it ſeems to follow from that circumſtance, that the juices lodged in theſe organs are rather lymphatic than gelatinous.

4. That it is infinitely more dangerous to attempt the reſolution of lymphatic congeſtions, when conſiderably old, than that of obſtructions formed by gelatinous juices, tho' theſe obſtructions ſhould not be more recent †. The reaſon of this difference is, that in old lymphatic congeſtions we run a riſque of exciting a motion of putrefaction, which, as we have obſerved, is the only one of which the albuminous juices are ſuſceptible §; whereas, on the contrary, we need never dread a ſimilar motion in the gelatinous juices.

* *For the moſt part* is added, becauſe there may be lymphatic obſtructions in the fleſhy parts.

† Beſides, how is this reſolution poſſible in tumors where the lymph is not divided by ſome juices, and where it is greatly condenſed by others? We, as yet, know no diſſolvent which can act on the humour when inſpiſſated. Sal-ammoniac itſelf cannot divide it. M. *de la Peyronie* ſent from *Fontainbleau* to M. *Queſnay* a tumor of a breaſt, which he had amputated. M. *Queſnay* cut ſome ſlices of it, and put ſome of them in water impregnated with ſal-ammoniac, and others of them in vinegar ſaturated with the ſame ſalt, but at the end of eight days found them all in the ſame ſtate in which he put them in.

§ However, the reſolution which may be attempted by ſal-ammoniac is leſs dangerous, becauſe that ſalt powerfully reſiſts putrefaction. Perhaps it may be dreaded leſt it ſhould irritate the part, and excite an inflammation, ſucceeded by a ſuppuration, which would favour putrefaction. But it is to be remarked, that ſal-ammoniac, tho' of an active nature, is ſcarce at all inflammatory.

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MEMOIR V. *By M.* QUESNAY.

Abſtract of Obſervations on the Exfoliation of the Bone of the Cranium : *With Remarks on the Means to be uſed either for haſtening or preventing the Exfoliation of that Bone.*

CASE I.

EXFOLIATIONS ſometimes greatly retard the cure of wounds of the head, and the remedies generally employ'd to haſten theſe exfoliations do not always ſucceed, which has engaged ſurgeons to find out ſome other more efficacious method. They have experienced, as we ſhall ſee in the following obſervation, that, in certain caſes, we can greatly advance this operation of nature, by making many ſmall holes on the ſurface of the bone to be exfoliated.

Operations to haſten the exfoliation.

A coachman, ſubject to the epilepſy, fell from his ſeat, and made a contuſion, with an ecchymoſis, in the ſuperior and middle part of the right parietal. When that tumor was opened, there was only perceived in the *cranium* a ſlight impreſſion, without fracture. But the ſymptoms, which were conſiderable, and perſiſted, left no reaſon to doubt but there was an extravaſation under the *cranium*, and that the trepan was conſequently neceſſary. The operation was very long, becauſe the bone was extremely thick, hard, and without a diploë. It, however, ſucceeded very well, except the exfoliation, which was in vain expected at the uſual time. Two months and an half expired without nature's making any advances that way. This retardment made it neceſſary to have recourſe to the perforative trepan; but the ſucceſs of it ſeem'd dubious, becauſe the bone was extremely hard, and with-

I. Obſervation, by M. *Turſan*, on the uſe of the perforative trepan, in order to haſten the exfoliation.

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without any appearance of a diploë. M. *Turſan*, however, determined to make ſeveral holes in the firſt table of the *cranium*. This expedient ſucceeded beyond his hopes, for a few days after, ſmall granulations appeared through theſe holes. This fleſh growing daily by little and little puſhed out the bone, which was to be ſeparated by the ſo long expected exfoliation.

The operation to which M. *Turſan* had recourſe, in order to procure exfoliation, is propoſed by M. *Beloſte**, but with views intirely different; for it is to hinder the exfoliation of the bone that he has adviſed it, that is to ſay, he propoſes it inſtead of the *rugine*, which ſome have recommended in a ſimilar caſe, and with the ſame intentions. Neither does he preſcribe this operation, except in recent wounds, where the bone is not as yet altered, in which caſe the holes furniſh fleſh, which by little and little covers the bone again.

II. Obſervation, by M. *Boutentuit*, on the bad ſucceſs of the perforative trepan, either to hinder or haſten exfoliation.

However, this obſervation does not always ſucceed, either in the one or the other caſe, as M. *Boutentuit* has remarked. A man, by a fall, made a wound almoſt circular, of an inch and an half in diameter, upon the ſuperior and lateral part of the coronal. This bone was laid bare, and it was propoſed, in order to haſten the cure of the wound, to hinder the exfoliation of the bone, and for that purpoſe to have recourſe to M. *Beloſte*'s expedient. M. *Boutentuit* accordingly made, with the perforative trepan, ſmall holes, deep enough to reach to the diploë; and expecting the little granulations of fleſh which were to appear thro' theſe holes, he dreſſed the wound with the balm of *Fioraventi*, and vulnerary water. He continued his dreſſings a month, without any thing appearing thro' theſe holes. He perceived, on the con-

* Chirurg. d'Hopit. p. 85.

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contrary, that the bone loſt its natural colour, and altered in ſuch a manner, as that he had nothing to expect but its exfoliation. M. *Boutentuit* then left the patient under the care of his ſurgeon in ordinary, who continued to dreſs him ſix weeks longer. Afterwards M. *Boutentuit* was called, and found the wound in the ſame ſtate with reſpect to exfoliation: He examined the wound attentively, and obſerved that the fleſh of its lips had incloſed the piece of bone which ought to have been exfoliated; he immediately diſengaged and removed this piece, which was about an inch and an half in diameter, and its thickneſs comprehended almoſt the whole of the external table of the *cranium*. The fleſh below was of a lively red, and intirely covered the bone. There was no further obſtacle to the cure, which was compleated in eight or ten days after the exfoliation.

Exfoliation retarded by the fleſh of the lips of the wound.

This obſervation ſufficiently proves the uncertainty of the ſucceſs of the operation which had been tried, whether to prevent or advance the exfoliation. We cannot, however, conclude from it, that this operation is to be intirely rejected; for its effect in both caſes depends on the ſmall granulations of fleſh which it procures. Now, theſe granulations are not imaginary, but proved by the obſervation of M. *Turſan*, and the teſtimony of *Beloſte*, and other practitioners. This fleſh may even ariſe from the ſurface of the *cranium*, without piercing it. *Fabricius Hildanus* relates that in a wound, wherein the teguments were looſen'd from the *cranium*, he replaced the divided fleſh, and covered the bone with it as well as he poſſibly could, then dextrouſly applied dry lint on what remained bare, and dreſſed the wound, the following days, with a great deal of precaution and quickneſs. At the end of ſome days

Certain dreſſings may hinder the ſucceſs of the operation.

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days he perceived ſmall red ſpots, which appeared like ſome ſmall drops of blood. Theſe ſpots augmented very ſpeedily, and furniſhed a fleſh, which appear'd ſpongious, and covered the bone in a ſhort time. In order to ſtrengthen this fleſh, he ſprinkled a deſiccative powder upon it. By this practice, the wound, which was very conſiderable, was cured, without the exfoliation of the denudated bone.

The practice, however, of M. *Boutentuit*, had not the ſame ſucceſs. Perhaps, if he had dreſſed the wound but very ſeldom, as M. *Beloſte* preſcribed, the bare part of the bone, which muſt have been dried by the acceſs of the air, and the too frequent uſe of ſpirituous and deſiccative remedies, which hinder the appearance of the fleſhy granulations, would not have been deſtroy'd, and the operation would have probably been attended with ſucceſs.

This dryneſs of the bone muſt have alſo rendered the ſame operation uſeleſs for procuring exfoliation; for the granulations of fleſh not having appeared at firſt, we could not expect that they would ſprout forth afterwards, and ſo puſh out the piece of bone which was to be exfoliated. We might, on the contrary, imagine that the holes which had been made at firſt, and long expoſed to the influence of the air, muſt retard the exfoliation, becauſe, by their means, the air was capable of drying the bone more deeply. It was neceſſary, therefore, when there was more intended than the exfoliation, to repeat the operation, and not remain contented with the firſt.

Uſe of the rugine in order to procure exfoliation.

The uſe of the rugine may alſo advance exfoliation, when it is retarded by the thickneſs of the piece of bone which ought to be exfoliated, and which cannot be eaſily puſhed out by the growing fleſh. We may, in ſuch caſes, have recourſe to the rugine, which, however, is not to be uſed but when the bone is viſibly

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viſibly altered, and the exfoliation pretty certain; for exfoliation does not always happen, at leaſt ſenſibly. When, therefore, we perceive, by the obſcure or yellowiſh colour of the bone, and the retardment of the exfoliation, that probably this operation of nature will be conſiderable, we may accelerate it by the rugine. But we ought not to wait till the piece of bone to be exfoliated is looſe, not only becauſe then the operation of nature being far advanced, this method would be uſeleſs, but alſo becauſe we ſhould run a riſque of bruiſing the ſubjacent fleſh, by preſſing on the piece of bone, and rudely ſhaking it by the action of the rugine.

Uſe of crowns of the trepan to procure exfoliation.

There are caſes wherein the piece of bone to be exfoliated is ſo conſiderable, that we are obliged to apply ſeveral crowns of the trepan hard by each other, and deep in proportion to the ſuſpected thickneſs of the vitiated bone. This method is to be uſed, eſpecially in the great exfoliations, which happen to large bones in different parts of the body. Theſe crowns of the trepan make the piece of bone yield more eaſily to the growing fleſh, and the exfoliation is more ſpeedily made.

III. Obſervation, by M. *Petit*, on an exfoliation, in which it was neceſſary to uſe the chiſel.

We have ſometimes alſo recourſe to the chiſel, in order to remove, by ſmall portions, the piece of bone which ought to be exfoliated, and which nature cannot ſeparate. A woman, who had been trepann'd, came to conſult M. *Petit*, more than a year after the operation; the exfoliation was only made on one ſide of the hole of the trepan. Several ſurgeons had ſucceſſively treated this woman, and endeavoured, without ſucceſs, to procure the reſt of the exfoliation. M. *Petit* found the ſide of the bone which was not exfoliated very black, but perceived no diſpoſition to exfoliation. He, therefore, determined to remove, at different times, this

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this black part of the bone, by the chiſel and mallet, by which means he diſcovered the cauſe of the retardment of the exfoliation. The part of the bone, which ought to have been ſeparated, had, on the ſide of the ſound bone, a groove into which the edge of that bone had inſerted itſelf, whilſt the piece of the bone was retained before by the edge of the circumference of the bone, which was exfoliated, and in ſome meaſure reproduced. Thus this piece of bone was every where too ſtrongly jamm'd to ſeparate of itſelf, ſo that M. *Petit*'s operation was abſolutely neceſſary. But this operation, and that which conſiſts, as we have ſaid, in applying ſeveral crowns of the trepan, require the ſame attention as when we uſe the rugine, as was obſerved before; for if the growing fleſh begins to ſeparate the piece which ought to be exfoliated from the body of the bone, we run a riſque of mangling it by practiſing theſe operations.

CASE II.

Bones do not always exfoliate, even after long ſuppurations.

IT is not ſurpriſing that bones do not exfoliate in wounds which are not allowed to ſuppurate, but it is not eaſy to comprehend why they do not ſometimes exfoliate, even in wounds with loſs of ſubſtance, which ſuppurate for a long time. Practitioners talk much of an inſenſible exfoliation in like caſes; but there are few who have either believed or obſerved, that ſometimes there is no exfoliation at all.

IV. Obſervation, by M. *de la Peyronie*, on the denudation of a bone with ſuppuration, without a ſubſequent exfoliation.

M. *de la Peyronie* was called to treat a wound of the head, in which the breadth of a *French* farthing, of the ſuperior lateral part of the coronal bone was laid bare; the want of an exfoliation greatly retarded the cure of this wound. M. *de la Peyronie* propoſed

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the operation mentioned in the two firſt obſervations, but the patient was frighted at the mention of the trepan. This ſurgeon, who ſaw no diſpoſition to exfoliation, and who was willing to ſee what would happen naturally, did not attempt to determine the patient to this operation, but, on the contrary, aſſured him that only a little time was neceſſary, and that he might already look upon himſelf as cured; ſo this ſmall wound produced no farther inconvenience than the trouble of covering it any how with lint and a plaiſter, which was rarely removed. M. *de la Peyronie*, attentive to what ſhould happen to the bone, examined it now and then, and obſerved that the wound diminiſhed by little and little, that the fleſh advanced inſenſibly upon the bone, and was firmly attached to it. The progreſs of this fleſh was indeed very ſlow; for this ſmall wound was more than nine months before it cloſed. The ſurgeon was not uneaſy, becauſe, ſo long as a denudated bone does not turn carious, and the wound is without any conſequence, we may ſafely wait for the exfoliation. There is an obſervation of M. *Ruiſch*, in which it appears, that in ſimilar caſes, the bone ſometimes revives, in proportion as the fleſh approaches; for in the cure which he mentions, there was form'd in the bone, which had long been expoſed to the air, and become black, a white circle near the fleſh, which advanced to cover it. M. *Rohault* relates a ſimilar obſervation: The exfoliation of a denudated bone, which was become as black as ink, was waited for, in vain, ſix months. M. *Rohault* being deſired to dreſs the wound, diſcarded the uſe of tents, which had been forcibly thruſt into the wound, and permitted the fleſh to ſprout up. There was formed, as in the preceding caſe, a white circle about the circumference of the wound; this circle daily approached more and more to the center, in

Surface of the bone ſometimes revives inſtead of exfoliating.

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in proportion as the fleſh grew, and the wound was entirely cloſed up in a month, without any appearance of exfoliation.

We have ſeen in the article on the multiplicity of trepans, in the eighth obſervation, communicated by M. *Chauvin*, that a bone internally denudated did not exfoliate, at leaſt ſenſibly, tho' a great extent of it had been laid bare, and tho' it had been kept moiſt by a purulent matter during the whole cure.

V. Obſervation, by M. *de la Peyronie*, on the ſame ſubject.

The ſame thing happened to a young man whom M. *de la Peyronie* trepann'd at *Fontainbleau*: He received a kick from a horſe, on the anterior and ſuperior temporal muſcle. M. *de la Peyronie* was obliged to remove a part of that muſcle, in order to lay bare a fracture, of which a conſiderable ſplinter had entered into the ſubſtance of the brain. There was perceived, during the cure, a diſcharge of purulent matter, from a ſinus under the coronal bone. This ſinus extended over the *os ethmoides*, and the matter which ſtagnated in it occaſioned an oedematous emphyſema of the whole countenance, and even of the hands. M. *de la Peyronie* thought that he ſhould be obliged to apply a crown of the trepan, about the middle of the forehead, beyond the ſuperciliary ſinus, in order to procure, by this counter-aperture, an eaſy diſcharge to the ſtagnant matter. However, he judged it expedient to try injections and a proper ſituation, in order to avoid this operation, if it was poſſible. This expedient ſucceeded, the matter was evacuated, the bone that was bare internally, and touched by the purulent matter which came from the ſinus, did not exfoliate, and the fleſh ariſing from the *dura mater* and brain adher'd to it, and covered it.

Wound of the temporal muſcle with fracture and leſion of the brain.

What is ſtill more ſurpriſing, with reſpect to this ſubject, is, that ſome-

Injections for a wound of the brain.

times

times there has appeared no exfoliation in carious bones, but they have been covered with a laudable fleſh, which has procured a perfect cure. *Fabricius Hildanus* informs us that he treated a young girl labouring under an ulcer with caries, which ſucceeded the ſmall-pox: This ulcer was perfectly conſolidated, tho' no exfoliation was perceived. It is not, however, to be doubted, but the vitiated part of the bone was inſenſibly carried off by the ſuppuration.

A good practitioner may eaſily diſtinguiſh the caſes in which there is an inſenſible exfoliation, from thoſe in which there is no exfoliation at all; for in the laſt caſe the lips of the wound by little and little come over the bone, and the ſurface of this bone, which is not as yet covered, remains ſmooth, till the lips of the fleſh advance to cover it entirely. But when the bone exfoliates, the fleſh comes out of the ſurface of the bone itſelf; and it is this fleſh which protrudes the ſurface of the bone to be exfoliated either ſenſibly or inſenſibly.

All theſe facts preſent young ſurgeons with different objects. They may here obſerve the various operations which art can furniſh, in order to aſſiſt difficult exfoliations. They hence learn not always to expect an exfoliation, at leaſt of the ſenſible kind, and not unſeaſonably to torment nature in order to obtain it, unleſs the long time the bone requires before it is covered, ſhould render it neceſſary to procure an exfoliation. The young ſurgeon may alſo learn from theſe obſervations, that an exfoliation may appear not to be making, becauſe the adjacent fleſh ſeems to approach to cover the bone, whilſt this fleſh, in advancing, ſecures the piece which ought to be exfoliated, as we have ſeen in the obſervation of M. *Boutentuit*. Thus, this fleſh becomes an obſtacle to the exfoliation, and retards the cure, for which reaſon we

RESULT.

must

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muſt attentively conſider, whether the lips of the wound, which advance upon the bone, adhere to it in proportion as they grow. Beſides, we know that when a ſcale of bone is to be exfoliated, the fleſh which protrudes it below, ſhakes it by little and little, and afterwards renders it looſe; in which caſe the exfoliation is certain, and we ought, without hefitation, to diſengage the lips of the wound, if they adhere to, and retain the piece which ought to be ſeparated. In the third obſervation, communicated by M. *Petit*, we have ſeen an exfoliation hinder'd, by an obſtacle that is not very common, and which ſhews us how careful we ought to be, in extremely long exfoliations, to examine if the retardment depends not on ſome particular obſtacle which we do not perceive. Beſides the operations we have propoſed for the advancement of exfoliation, ſuch as the perforative trepan, rugines, crowns of trepans, and the chiſel, it is ſometimes neceſſary to have recourſe to another method; for if the part of the denudated bone changes, and becomes carious, or bedewed with a putrid ſanies, that hinders the production of fleſh, by which the exfoliation might be made, deſiccative remedies, and even powder of euphorbium, are not always ſufficient to dry the caries; in which caſes we are obliged to apply the actual cautery, which is the ſureſt and moſt efficacious means, both of ſtopping the caries, and haſtening the exfoliation.

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MEMOIR VI. *By M.* PETIT.

Description of a new Elevator, *with Reflections on those hitherto used.*

IN wounds of the head, accompanied with fracture and depression, it is sufficiently known of how great importance it is to raise those bones, which either wound or compress the *dura mater* and brain, to that level which they were naturally in. We also know the different instruments which have been invented to perform this operation, which, in a moment, may change the fate of the patient, and, as it were, recal him from death to life. But, as practice has enabled me to discover several defects in these instruments, I thought it expedient to enumerate these defects, and, at the same time, propose a new elevator, which, in my opinion, is free from them.

Defects of the common elevator.

The instruments hitherto used to raise the bones of the *cranium* depressed on the *dura mater*, are, principally, the *common elevator*, the *claw*, or the *griffin's foot*, and the *triploid*, with or without the *terebra*, and sometimes the *terebra* alone.

We use elevators, the griffin's-foot, or the claw, only as levers, which require both a fulcrum or point to move upon, and a moving force. Every one knows, that this fulcrum or point is either in the hand of the operator, or on the neighbourhood of the bone which is to be raised.

In the former case, that is, when the hand which is the moving force, serves at the same time as a fulcrum or support to the lever, the end of the thumb keeps the elevator secured against the middle of the fore-finger. The long branch of the lever is included in the palm of the hand by the other fingers, and by the *thenar*, a muscle commonly called *abductor*

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abductor pollicis manus. This preſſing on the extremity of the long branch of the lever, communicates to it all the force which it receives from the hand, and which the hand receives from the arm. This makes the long branch ſink or ſubſide, whilſt by the ſame means the ſhort branch under the depreſſed bone is raiſed.

I am ſenſible, that in performiug thus, the operator has a great deal of ſtrength, but the hand not having a neceſſary command and firmneſs ſhakes, and the end of the elevator may eſcape. This accident would ſhake all the *cranium*, and produce a kind of ſtunning or commotion, which muſt neceſſarily be avoided.

In the ſecond caſe, that is, when we ſupport the elevator, the griffin's-foot, or any other lever of a ſimilar nature, on the bone adjacent to that which is to be raiſed, I own that the lever is better ſecur'd, but, at the ſame time, we run a riſque of depreſſing the bone on which it reſts, without raiſing that which is depreſſed.

The force of the triploid is much greater than that of the reſt of the levers; but it is not for this reaſon preferable to them. The reſiſtance of depreſſed bones is not ſo great, but it may be ſurmounted by a force leſs conſiderable than that of the triploid.

This inſtrument has three feet or branches like a tripod. Theſe reſt on three points at a ſmall diſtance from the circumference of the wound, and as theſe branches are at an equal diſtance from each other, the whole of the wound is under the vault or arch formed by them.

The moving force is applied to a nut, which receives the ſcrew of the upper endof an upright ſhaft, the lower part of which paſſes to the center of the arch. This lower part has its extremity bended in form of a hook, which is introduced under

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the bone to be raiſed; ſo that by turning the nut to the right, the ſcrew is gradually raiſed. Thus the hook raiſes the depreſſed bone under which it is introduced, with all that force of which a ſcrew is capable.

This is the method of uſing the triploid alone: But it is neceſſary that there ſhould be a hole in the *cranium*, and that this hole ſhould be ſufficiently large for the introduction of the hook under the depreſſed piece. This only happens when there are large fractures of the bone with loſs of ſubſtance, or when a crown of the trepan has been previouſly applied. When, on the contrary, there is no means of introducing the hook of the triploid, we make a hole, with the perforating trepan, in the piece of the bone we intend to raiſe. In this hole we engage a very ſhort terebra, and after having paſſed the hook of the triploid into the handle of the terebra, we turn the nut, the ſcrew mounts, and raiſes at once the terebra and the depreſſed piece of bone. Theſe are the two methods of uſing the triploid, that is to ſay, either with or without the terebra.

The inventor of the triploid has been very ſenſible of the defects of the griffin's-foot, and of the other elevators. Theſe he has endeavoured to remedy by the three branches, which, being placed at a great diſtance from the fractured bones, run no riſque of depreſſing them, which, as before obſerved, the common elevators may do, when they are ſupported on the brink of a fracture. This kind of triploid being fixed, and its hook ſecurely engaged under the bone, cannot ſlip, as the common elevator frequently does, when it has no other ſupport than the fore-finger of the hand which moves it. But, notwithſtanding all theſe advantages of the triploid, above the other elevators, it muſt be own'd that it has a great many defects.

1. It

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1. It is difficult to find three points where we can fix it without producing pain, and very often we cannot find ſo much as one point, becauſe the parts adjacent to the wound are bruiſed, inflated, or painful.

2. This inſtrument muſt be applied in ſuch a manner, as that the center of the arch may be directly oppoſite to the depreſſed bone, whether to engage the hook under it, or to fix the terebra in it. Beſides, if we have not juſtly taken the meaſures neceſſary, and which are very difficult to be taken on ſuch occaſions, we are obliged to unturn the ſcrew, in order to find the right point.

3. It is not only ſufficient to have found this point, but we muſt alſo introduce the hook under the bone, which is a very difficult taſk; for if we vary but a line, or twelfth part of an inch, from the proper place, we are obliged to remove the three branches.

4. We can only uſe the hook in caſes where there are great apertures in the *cranium*, becauſe this hook has a certain length, which is neceſſary, in order to its taking hold under the depreſſed bone, and becauſe this length requires an aperture greater than the length of the hook, which muſt, by no means, be entered forcibly.

5. One of the greateſt defects of the triploid is, that, in order to apply it with the terebra, we are, with the perforator, previouſly obliged to make a hole in the depreſſed bone, which may, by this means, be poſſibly ſtill more and more depreſſed.

6. This inſtrument is of ſo compound a ſtructure, that it can hardly be uſed except by operators of great dexterity; whereas, it were to be wiſhed that chirurgical operations were rendered as ſimple as poſſible, that they might be performed in country places as well as in cities. In a word, the greateſt of our modern practitioners are ſo fully convinced of

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the uſeleſneſs of the triploid, that few of them have it except to adorn their ſurgeries.

The reflections which practice has enabled me to make on the defects of the inſtruments before-mentioned, have alſo induced me to contrive an elevator, by means of which we may avoid the long, difficult and dangerous operation, which is almoſt inſupportable from the triploid, the griffin's-foot, and all the other elevators hitherto uſed.

It muſt, therefore, be allow'd, that the principal thing in this operation, is to find on the *cranium* a ſupport for the lever, as near as poſſibly may be to the bone to be raiſed, and that this ſupport may be on a ſolid plane, that ſo, without breaking, it may ſuſtain the effort made in raiſing the depreſſion.

A new elevator.

With this view I have ordered a kind of bridge to be made, in order to ſerve as a ſupport or fulcrum to the lever, ſince, by this means, the hand of the ſurgeon is no more than the moving force, and ſince this force does not require to be ſo great by far, as when the hand is at once the ſupport of the lever, and the force which moves it.

The operation performed by this inſtrument, is neither ſo long nor perplexing as that of the triploid. Beſides, we can give it as much force as we pleaſe, and it has all the juſtneſs and accuracy which are either wanting, or very difficult to be found, in the other inſtruments. It is made in the following manner:

This elevator is compoſed of two principal parts, namely, a lever, and a kind of bridge, which ſcrews as a ſupport to it.

The lever is about eight inches long, about five lines broad, and about two lines thick. The whole of it is ſtrait, except a ſmall incurvation at the extremity of the ſhort branch of the lever, This part is narrower, thinner, and flatter than the reſt, that

it

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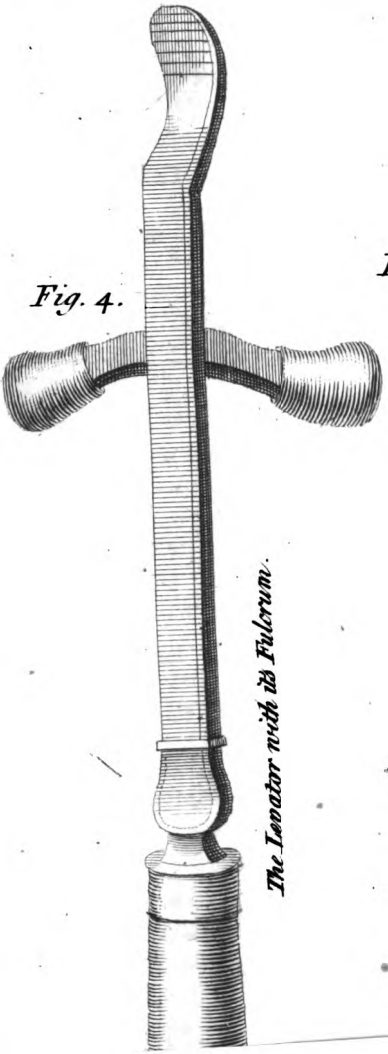

Fig. 4.

Fig. 2.

Fig. 3.

The Levator with its Fulcrum.

have mentioned, which being fixed in the ſcr

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it may be the more eaſily convey'd under the bone to be raiſed. This end is alſo cut into ſeveral tranſverſe grooves, to hinder it from ſlipping from under the bone to which it is applied; whereas the under part of this end and its edges are round, and very well póliſh'd, that it may not wound the *dura mater*.

The other end of this lever, which I call the long branch, is fix'd in a ſmooth wooden handle, that the hand which conducts it may not be incommoded by it. The ſurface of the under part of the lever has ſeveral holes in its middle made length-ways: Theſe holes, which are wormed, are about two lines diſtant from each other, and ſerve to receive a ſcrew, which bounds and fixes the lever's fulcrum or point of reſt, and this ſcrew may be equally fixed in each of theſe different holes. The number of theſe holes, diſpoſed in the manner we have mentioned, renders it eaſy to make the fulcrum nearer or farther diſtant, and conſequently to give the lever more or leſs force, as we ſhall afterwards ſhew.

The ſecond part of the elevator, and that which I look upon as eſſential, is a kind of bridge, on which the lever is to be ſupported. It reſembles the bridge of a violin, and comes ſtill nearer to that generally uſed by carpenters and ſome other tradeſmen.

The part of this bridge which is applied to the *cranium* is arched, that it may only touch by its two legs or extremities.

Theſe two legs ought to have as much ſurface as poſſible, not only in order to render the ſupport of the lever more ſtable, but alſo that the effort which the bone muſt ſuſtain, may be divided on a greater extent of its ſurface. Theſe extremities are covered with ſhamoy-leather, both to hinder them from ſlipping, and from making any impreſſion on the bone. At the top of the bridge is the ſcrew we have mentioned, which being fixed in the ſcrew-

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holes fixes it to the lever. This is neceſſary, in order to hinder the bridge from ſlipping under the lever.

It daily happens that when operators, without having taken proper meaſures, fix the fulcrum of their levers, the reſiſtance of the weight makes the lever change its ſituation. We may eaſily judge that ſuch an accident would be a great diſadvantage in our operation. In a word, at the very time we make the elevation of the depreſſed piece of bone, if the reſiſtance of this piece ſhould be greater than the power of the lever, the fulcrum or point of ſupport would be changed, and the extremity of the lever ſlipping from under the bone to be raiſed, this bone would recoil on the *dura mater*, and ſtrike it with a force proportion'd to the ſuddenneſs with which the lever ſlipt from under it.

It was, therefore, neceſſary to fix the lever to the bridge, but it was alſo neceſſary that this joining ſhould permit the lever to move on the fulcrum, without the latter following the motions of the former. This advantage we reap from the ſcrew at the top of the bridge, which, without this circumſtance, would have followed the lever in all its motions.

Another advantage we draw from this ſcrew is, that by obſerving not to ſcrew it to the bottom of the ſcrew-hole, the feet which are fixed give a play to the lever, and permit us to turn it both to the right and left, as upon a pivot, by which means we may place this lever under all the different parts which require elevation, without being obliged to change the place of its fulcrum or ſupport.

With reſpect to thoſe caſes where it would be impoſſible to place the fulcrum or point of ſupport on denudated bones, either on account of the great bruiſing of the pieces, the ſmall extent of the wound, or the inflation of the fleſh, which alſo diminiſhes its

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its largeneſs, I have contrived another bridge, which is longer and higher. We may, in caſes of neceſſity, make it larger; ſo that its branches are farther from the lips of the wound, that they may not incommode them, and that the ſurgeon may conveniently perform all the motions neceſſary to raiſe all the pieces of the depreſſed bone.

I have alſo order'd the ſcrew of this ſecond bridge to be made exactly of the ſame ſize with that of the former, ſo that they may enter the ſame holes.

By taking theſe meaſures, we may have ſeveral bridges of different bulks, to be uſed according to the different caſes, which may occur in practice.

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MEMOIR VII. *By M.* QUESNAY.

REMARKS *on Wounds of the Brain: In which it is proved, by a great many Obſervations, that the Brain is ſuſceptible of many Operations, which may, in various Caſes, preſerve the Lives of Patients, together with an Enquiry into the Remedies moſt proper for the Cure of Wounds in that Organ.*

THE brain is formed of a ſubſtance ſo tender, and its functions are in general ſo important to life, that the leaſt ſhock or wound ſeems capable of producing an irreparable diſorder in it, and of attacking life in its principle. Notwithſtanding this, we have a vaſt number of obſervations which fully evince, that wounds of this organ, eſpecially of its cortical and medullary ſubſtances, are almoſt as eaſily cured, as thoſe of moſt of the other viſcera.

Wounds of the brain cured.

A child, of ſeven years of age, fell from an eminence of ſeven or eight feet high, and made a very conſiderable wound in the right lateral part of the coronal bone, with a fracture, conſiſting, as it were, of many cracks diverging from a common center. The ſuperciliary ſinus was comprehended in this fracture, which extended to the orbit of the eye. There were four ſegments, whoſe angles were a little depreſſed in the ſubſtance of the brain, and which, after being raiſed, left an aperture which render'd the trepan unneceſſary. The *dura* and *pia mater* were contuſed and lacerated to the extent of a ſilver penny, and a ſmall portion of the brain was protruded thro' this aperture. No bad ſymptoms

I. Obſervation, by M. *Froumantin*, ſurgeon of *Angouleme.*

Wound of the brain cured, notwithſtanding a very great diſorder.

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ſymptoms ſupervened, notwithſtanding the irregularity of the child, who would neither keep his bed, nor obſerve any regimen. But the wound was ſo great, that ſix months eſcaped before the patient was entirely cured.

This obſervation has nothing aſtoniſhing, but ſerves to confirm a great many ſimilar facts related by authors. *Bernard Suevus*, among others, in his treatiſe concerning the inſpection of mortal and curable wounds, printed more than an age ago, collects many cures of this kind from the antients. Before *Bernard Suevus*, *Andreas Crux* had furniſhed us with a large collection of ſimilar cures performed by former practitioners. The following obſervations are ſtill more important, ſince in them we find cures far more aſtoniſhing and uſeful in practice.

II. Obſervation, by M. *Belair*, on a fracture with many fragments, and a great contuſion, with loſs of ſubſtance in the brain.

A boy, of eight years of age, was ſtruck by a horſe on the left ſide of the head, by which means the parietal bone was wounded in the poſterior and ſuperior part. M. *Belair*, being called, attempted to replace the pieces of the bone. But the brain was ſo much injured below this fracture, that on each motion he made, in order to adjuſt theſe fragments, portions of the cortical ſubſtance came out, ſo that during the time he was replacing theſe pieces of bone, there was more than the bulk of an hen's egg eliminated, M. *Belair* being obliged to depart, left the patient under the care of a ſurgeon of the town, with whom he converſed on the method of treating the patient, tho', at the ſame time, he had no hopes of his recovery, ſo that he was greatly ſurpriſed when he heard next year that the child was cured. He was willing to ſee it, and found it in a ſtate of good health. There was in the part of the wound a ſmall depreſſion, capable of containing a nutmeg. There were

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were alſo inequalities in the cicatrice, but the child's judgment was not in the leaſt affected.

The bones, which were all adjuſted, had undoubtedly left interſtices, which ſupplied the place of the trepan, and gave vent to the matter which ſo large a contuſion muſt have furniſhed. We muſt even believe that if the pieces of bone had not left interſtices to procure a ſufficient evacuation of the matter, which muſt have been ſupplied by the ſuppuration, M. *Bagieu*, inſtead of having adjuſted theſe fragments, ſhould at leaſt have removed thoſe which might have oppoſed the elimination of this matter; for the violent ſuppurations of which the brain is ſuſceptible are always greatly to be dreaded, and require a great deal of attention in the ſurgeon. But, however much theſe great ſuppurations are to be dreaded, they have often had an happy ſucceſs, and have, in a particular manner, ſerved to make the force and advantage of the art known. The following obſervation ſufficiently indicates the advantages to be expected from ſurgery in ſimilar caſes.

III. Obſervation, by M. *Bagieu*, on a gun-ſhot wound penetrating into the brain.

A large and robuſt young man, of ſeventeen years of age, was wounded by a muſket-bullet. This bullet, which was diſcharged from a lower to an higher place, pierced the upper lip, paſſed thence into the right noſtril, and penetrated the arch of the orbit, in order to enter the *cranium*, whence it was diſcharged at the crown of the head, in the ſuperior part of the coronal near the ſagittal ſuture. It made, in this part, a fracture, which extended to the parietal, and produced in the teguments a great wound, with loſs of ſubſtance; an inflation, which render'd the head monſtrous, ſupervened. There was firſt an inciſion made in the wound of the orbit, from which, on the removal of the firſt dreſſing, there was diſcharged a portion of the two ſubſtances of the brain, as large as a ſmall hen's egg. The

eye

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eye was become very large, eſpecially the upper eye-lid, in which an inciſion was made, to give vent to the blood which was thought to be extravaſated in it. But, inſtead of blood, a ſplinter of bone, and a portion of the two ſubſtances of the brain, almoſt equal to a third of that before evacuated, were diſcharged. Theſe wounds were ſoftly dreſſed with pledgets, at firſt dipt in vulnerary water, and ſome days after in a digeſtive, animated with ſpirit of wine. Veneſections, both in the arm and foot, were not forgot; but ſtill ſome ſmall portion of the brain was evacuated. On the fourth day the ſuppuration of the ſubſtance of this organ began to appear, by a diſcharge of a pretty fluid matter: On the fifth this diſcharge was conſiderable: On the ſixth the ſuppuration became general. After the veneſections the patient was pretty well, except on account of his weakneſs, till the eleventh. On the twelfth his weakneſs became more conſiderable: On the thirteenth the matter which flow'd from the brain, and had been copiouſly diſcharged, both from the ſuperior and inferior wounds, was, in ſome meaſure, retain'd, and the patient fell into a lethargy, and univerſal liſtleſneſs. M. *Bagieu*, who treated the patient, again examined his wounds with great attention; upon which he perceived, in the ſuperior wound, a large piece of looſe bone, which he removed without difficulty; but the patient, inſtead of being relieved by this means, became worſe till the fifteenth, when it was thought he would die. M. *Bagieu* obſerv'd, that in preſſing the ſkin in the part where he had extracted the piece of bone, pus was diſcharged, which made him ſuſpect that the matter was accumulated in that place. As he was of this opinion, he remov'd the ſkin, and ſome portions of the *dura mater*, which retained this matter. This operation reſtor'd the evacuation of the matter of the ſuppuration. The pulſe was raiſed, and the patient's

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patient's ſpeech return'd next day, after which the ſuppuration dried up by little and little. On the nineteenth the fleſh began to granulate, and the wound in the crown of the head was covered in a ſhort time. The like did not happen to that of the eye-lid; for there ſupervened a conſiderable fungus, occaſioned by ſome ſplinters detached from the neighbouring bone. But, notwithſtanding all the care which was at firſt taken to cut and conſume this fungus, it was neceſſary to wait till all theſe ſplinters were diſcharged, after which the excreſcence was eaſily deſtroy'd. The wound was ſoon cloſed up, and the patient entirely cured, without any remaining deformity.

We find, in *Valeriola**, an obſervation of the ſame kind, tho' it does not appear that in the cure there were ſuch terrible ſymptoms to be overcome. A ſoldier received a wound, with a muſket-bullet, which paſſed thro' both temporal bones. Notwithſtanding which, he was cured, tho' he remained blind and ſomewhat deaf. *Rhodius*† alſo relates the hiſtory of a ſoldier cured of a thruſt of a javelin, which entered between his eyes, and came out at the crown of his head. But it is to be obſerved that there is a great difference between gun-ſhot wounds, and thoſe produced by ſimply penetrating inſtruments: Since *Wepfer*‖, taught by his own experience, thinks that no perſon can recover of a gun-ſhot wound when it penetrates deep into the brain. We intend, however, to ſhew, in ſpeaking of wounds of the brain with extraneous bodies, that there are facts which prove the contrary, as well as thoſe we have related, eſpecially that by M. *Bagieu*, which cannot be called in queſtion, ſince this cure was performed under the eyes of many ſkilful ſurgeons. But what is more ſurpriſing in wounds of the brain, is,

* Liv. 4. obſ. 10. † Bonet. biblio. de chir. cent. 1. obſ. 72.
‖ Diſſertat. de apopl. 228 et 345.

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is, that the ſubſtance of this organ, which is ſo ſoft and delicate, can ſuffer the preſence of conſiderable extraneous bodies, and even retain them for a long time before they produce any ſymptoms.

IV. Obſervation, by M. *Marechal*, on a ball lodged in the brain.

A brigadier, in the *French* ſervice, received a wound with a muſket-bullet above the eye-brow. The ball penetrated the bone, and lodg'd itſelf in the brain. The patient recovered ſo well as to return next year to the campaign, where he died, as it is ſaid, by the intenſe heat. When his head was open'd, the ball was found ſunk two finger-breadths into the ſubſtance of the brain, where it had remained without producing any diſorder.

V. Obſervation, by M. *de la Martiniere*, on the ſame ſubject.

M. *de la Martiniere* has preſented to the academy a grenadier, in whom there remain'd, in the middle inferior part of the coronal, between the two frontal ſinuſes, a ſmall fiſtular ſinus, cauſed by a gun-ſhot wound. The ball had pierced the bone, without making any vent for itſelf. It had in entering, towards the left ſide, grazed upon the ſuperciliary ſinus, which it had fractur'd: The *dura mater* was alſo lacerated. During the cure of this wound there were ſeveral ſplinters extracted, which had been detached from the internal table of the coronal. The courſe of the ball was eaſily followed by the probe along the ſinus, but it was impoſſible to find it. The patient had, at ſeveral intervals, various ſymptoms, ſuch as a fever, lethargy, and delirium. Thoſe who had the care of him had recourſe to veneſections, and all other methods of relief. On the twenty-ſeventh day the patient ſeem'd out of danger, and then the ſearch of the ball becoming uſeleſs, they thought of cloſing up the wound. The patient was cured, only there remain'd a ſmall ſinus, which might probably depend on the ſuperciliary ſinus which had been fractured. This ſoldier is now among

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among the invalids, and there has since no symptom happen'd to him which seem'd to be produced by the ball. These observations greatly confirm the facts of this nature, related by various authors; for instance, that of *Preussius*, concerning a ball, which, at the upper end of the nostrils, enter'd the *cranium*, where it remain'd without proving mortal. *Fabricius Hildanus** has given us the history of a ball, which pierced the coronal, and was lodged in the head. The cure was difficult on account of the fracture it had made in the bone, but it was nevertheless happily terminated. The patient happening to die six months after, and his head being opened, the ball was found near the sagittal suture, between the *cranium* and the *dura mater*, which was not injured. *Vesslingius*†, in dissecting the brain of a woman publickly, found the end of a dagger with which she had been wounded five years before. Neither did any incommodity remain, except an head-ach every time it rain'd. *Zacutus*‖ relates that a man had in his brain, for eight years, the half of a knife, without being incommoded by it. *Joannes Dominicus Sala* informs us that he saw a man who received a wound with a sword, of which he was perfectly cured, tho' the point of the sword remained in his brain all his life.

Besides, a great many similar facts, of which we cannot doubt, have happen'd in our own days. Such is the history related by M. *Anel*§, of a ball which broke the coronal bone, and entered the brain. The patient was cured, and the ball for many years remain'd in his head without any incommodity: At last he died suddenly when playing at cards. The surgeons who cured his wound, upon opening his head, found the ball upon the pineal gland, with newly

* Cent. 2. obs. 2. † Bonet. bibl. chir. cent. 1. obs. 73. ‖ Ibid.
§ Mangot. bibl. chirurg. cranii fracturæ. We also find, in the philosophical transactions, the history of a ball lodged in the substance of the brain for several years, an. 1709. N° 310. art. 6.

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newly extravaſated blood, which was coagulated. That end of an arrow, which M. *Majault*, ſurgeon-major of the hoſpital of *Doway*, ſays, remain'd four months in the brain of a ſoldier who was cured of it, furniſhes us with an inconteſtable fact of this kind, ſince M. *Briſſeau*, phyſician of the ſame hoſpital, M. *de la Foſſe*, firſt ſurgeon to the queen, and inſpector-general of the hoſpitals, together with ſeveral other ſurgeons, were witneſſes of it.

It has often happen'd that ſplinters or pieces of the *cranium* have remain'd for a long time concealed in the ſubſtance of the brain. M. *Manne* relates an example of it: The ſplinter of which he ſpeaks remained a month fixed in the brain, without producing any troubleſome ſymptoms. M. *Fanton* * ſaw a portion of the inferior lamina of the frontal bone, which had entered into the ſubſtance of the brain of a maſon, where it remained for ſeveral months, without obliging the patient to diſcontinue his buſineſs.

Hartſoëker †, in order to aſſure himſelf that wounds of the brain are not abſolutely mortal, for ſome time fixed a dog to a table, by driving a nail through his brain, and when the animal was ſet at liberty he poured *Rheniſh* wine into the wound, which was very ſoon cured, without producing any ſymptom. *Verdriez*, in the *German Ephemerides*, has given us an experiment nearly ſimilar. But the caſe is not exactly the ſame in wounds of the *cerebellum*, for it has been obſerved, that theſe almoſt always prove mortal‖. *Willis*¶ ſays, that tho' we cut the whole brain of a dog, neither the motion of the heart nor reſpiration ceaſe, whereas both theſe ceaſe as ſoon as we injure the *cerebellum*. There are, however, many obſervations which evince that the *cerebellum* has been often found

Experiments made on the brain.

N almoſt

* Manget. bibl. chirurg. cranii fracturæ.
† Goëlike hiſt. chir. p. 325.
‖ Alberti jur. med. P. 1. pag. 317. § 43.
¶ De conſtan. anim. bibli. 4. cap. 1.

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almoſt all gangrened. M. *de la Peyronie* found it all deſtroy'd by an hard tumor, which was formed by little and little, and which was enlarged to ſuch a degree, that there remained no more of the *cerebellum* than a ſhapeleſs lamina, which covered the tumor. We alſo find ſome examples of wounds of the *cerebellum*, in which the ſubſtance of that part has been entirely deſtroy'd, and yet the patients have ſurvived ſuch wounds ſeveral days. M. *Goëlike* obſerves that, near the brain, wounds of the ſpinal marrow are abſolutely mortal. He thruſt a ſharp knife betwixt the firſt and ſecond vertebræ of a dog's neck, upon which the animal was forthwith ſeiz'd with convulſive motions, and died. M. *de la Peyronie* having remark'd, by a great many obſervations, that the *cerebellum*, the lobes of the brain, the channel'd bodies, the pineal gland, and ſome others taken in particular, are not abſolutely neceſſary either to life, or to the faculties of the ſoul, eſpecially to knowledge and judgment, he has been convinced of the falſity of the different opinions entertained concerning the ſeat of the ſoul, and diſcover'd, by all the obſervations which ſurgery and anatomy could furniſh him with, that, on the contrary, the *corpus calloſum* cannot be wounded without diſturbing or aboliſhing theſe faculties; whence he rationally concludes, that the *corpus calloſum* is the part of the brain where the ſoul exerciſes her functions †.

The brain ſuſceptible of operations.

The knowledge of all theſe facts preſents ſurgeons with a particular piece of inſight; for not only the cures we have related, but alſo a great many ſimilar ones, found in the obſervations of different authors, ought to encourage them to treat wounds in the ſubſtance

† M. *de la Peyronie* has given the academy of ſciences a memoir on this ſubject, which was read at their public meeting, on wedneſday after the quaſimodo, in the year 1741.

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ſtance of the brain, however conſiderable, with all poſſible attention, eſpecially when there are any hopes of ſucceeding. Beſides, theſe facts make ſurgeons perceive that they may, eſpecially in deſperate caſes, attempt certain operations on the brain, which are authoriſed by the danger of the patient, and which the indications in a manner preſcribe as the only means of relief; that they may, for inſtance, open abſceſſes in the ſubſtance of the brain, when ſymptoms demand it, ſearch for extraneous bodies ſuppoſed to be lodged in that organ, remove portions of the ſubſtance of the brain when it is mortified, and cut off funguſes and carcinomatous tumors to which the brain is ſubject. The reader is, on this occaſion, to conſult the abſtract of obſervations on the multiplicity of the trepan, in order to remark that a ſurgeon may make, in the *cranium*, the various apertures neceſſary to perform theſe operations eaſily.

Operations of which the brain is ſuſceptible.

In order to evince the neceſſity of theſe different operations, and enumerate the circumſtances which may render them more or leſs poſſible or difficult, we ſhall relate ſome obſervations, and make ſome remarks, ſufficient to diſcover the different caſes in which theſe attempts may be more or leſs ſafe and expedient. We ſhall therefore begin with latent abſceſſes in the ſubſtance of the brain.

In wounds of the head there are particular caſes, in which, after having open'd the *cranium*, we are alſo obliged to make an aperture in the membranes of the brain, in order to diſcover the cauſe of the ſymptoms which remain after the operation of the trepan. This operation is not always ſufficient, and theſe ſymptoms are often ſupported by a ſuppuration, happening in the ſubſtance of the brain, and very frequently oppoſite to the fracture which rendered the trepan neceſſary. This ſuppuration forms

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abſceſſes, which diſcover themſelves by no external ſign; neither can we be determined, except by the violence of the ſymptoms, to make an aperture in the ſubſtance of the brain, in order to give vent to the matter of the abſceſs ſuppoſed to be the cauſe of theſe ſymptoms. But the uncertainty of ſucceſs has always been more than a ballance for theſe conjectures: Surgeons, for fear of riſquing their reputation too much, chooſe rather to let the patient die, than make ſuch attempts. Our dread, however, of opening the brain, may be compared with that of the antients in making an aperture in the *dura mater*, which at preſent is opened without any heſitation, and this operation has preſerved the lives of an infinite number of patients. Perhaps ſucceeding practitioners will be ſurpriz'd at our timidity in opening the ſubſtance of the brain. We have already a great many facts which upbraid us with this cowardice, and which ought, in deſperate caſes, powerfully to induce us to venture on the operation we now propoſe.

VI. Obſervation by *M. de la Peyronie.*

A child, in conſequence of a fall on the left parietal bone, was ſeized with ſymptoms which indicated the neceſſity of the trepan. This operation gave vent to a conſiderable extravaſation made on the *dura mater*. This membrane was in a laudable ſtate, and the ſymptoms diſappeared till the 28th day, when the patient was ſeized with convulſions, a kind of palſy of the right ſide, a lethargy, and an almoſt continual loſs of ſenſe. M. *de la Peyronie* opened the *dura mater*, ſuſpecting that there was, under it, an abſceſs, which occaſioned theſe ſymptoms; for otherwiſe there were no particular ſigns which could aſſure him of this circumſtance, neither did he find any thing below this membrane. The imminent danger of the pa-

Abſceſs of the brain, which might have been opened at the aperture of the trepan.

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patient made him think of opening the brain itſelf, but the attempt being thought too bold, was oppoſed, and the child died of convulſions. M. *de la Peyronie* open'd the head, where he found, oppoſite to the aperture of the trepan, an abſceſs in the ſubſtance of the brain, which was only three or four lines in depth. Thus, from the various examples related, it is not to be doubted but the child's life might have been preſerved, if M. *de la Peyronie* had ventured on the operation we now recommend.

VII. Obſervation, by M. *Bellair*, on a caſe ſimilar to the preceding.

M. *Bellair* relates an almoſt ſimilar caſe. A man about twenty nine years of age received a wound with an halbert, which penetrated about a finger-breadth into the brain. The functions of the ſoûl were not diſturbed by this wound, and the patient, after its reception, travelled a long way without any perſon's aſſiſtance. Many pieces of the fractured bone were extracted, and the wound was dreſſed as in caſes of the trepan. Forty four days paſſed without the appearance of any ſymptoms, and the patient got out of bed every day; but at the end of this time, he was ſeiz'd with a fever and ſhivering, and died in twenty four hours. Upon opening his head, there was a ſmall abſceſs found in the cortical ſubſtance oppoſite to the wound, and the *dura* and *pia mater* were tenſe and inflamed.

It has often happen'd, that the *dura mater* being opened by a ſurgeon, or by the blow which inflicts the wound, nature herſelf has ſatisfied the indications preſented by theſe abſceſſes. The following obſervation, and many others which we could relate, and in which we ſee that the rupture of ſimilar abſceſſes has had happy effects, ſufficiently evince, that the operation we propoſe may often ſucceed happily, if it diſcovers the abſceſs.

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A child of nine years of age, by falling on a ſquare ſtone, loſt his ſenſes: M. *Petit* being called, found, two or three finger-breadths below the right eye, a wound ſufficient to admit the finger. He perceiv'd that the bone was fractur'd and depreſs'd, which obliged him to make a crucial inciſion, ſufficiently large to lay bare the whole of the fracture, and procure a proper ſpace for the application of the trepan: he deferr'd the operation till next day, on account of the hemorrhage: almoſt as ſoon as he had applied his apparatus, the patient's ſenſes were reſtor'd, and he was blooded ſeveral times. M. *Petit*, upon uſing the trepan, found no blood extravaſated under the *cranium*: he raiſed the depreſs'd pieces of bone, remov'd ſuch as were entirely looſe, and cut off all the inequalities which could have proved injurious to the *dura mater*. No ſymptoms happened during the firſt days, till the night ſucceeding the fifth, when the patient was ſeized with a gentle fever, and became reſtleſs, hot, and very thirſty, which laid a foundation for veneſection next morning: in the evening, his head being heavy, and the fever being augmented, he was blooded in the foot: next day the wound was more dry than uſual, and the *dura mater* appearing ſomewhat brown and prominent, reſiſted the touch, whence M. *Petit* ſuſpected that there was ſome liquor extravaſated under it. He had hardly opened this membrane with a lancet, till a ſpoonful of brown and fetid ſerum was diſcharged from an abſceſs formed in the ſubſtance of the brain: he augmented the aperture as much as poſſible, but the firſt evacuation did not diſſipate the ſymptoms, becauſe the patient was very much agitated next night. He was delirious, and gnaſhed his teeth frequently: his pulſe was hard and in-

Apertures of abſceſſes in the brain.

VIII. Obſervation by M. *Petit* on an abſceſs of the brain opened naturally and cured.

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intercadent: in the morning, however, the dreſſing was very moiſt; the lethargy was conſiderable in the evening, and during the whole night: next day, which was the eleventh from the reception of the wound, all theſe terrible ſymptoms diſappeared: M. *Petit*, upon dreſſing the patient, perceived the cauſe of ſo ſudden a change, for he found the apparatus full of a very fetid pus. There were ſome flakes of the ſubſtance of the brain afterwards diſcharged: thoſe portions of the membranes which were mortified, were detached, and the patient was perfectly cured at the end of two months. We ſhall afterwards relate an obſervation of M. *de la Peyronie* on the ſame ſubject, whoſe ſucceſs was alſo very happy.

Though in Obſervators we find a great many ſimilar abſceſſes, yet it is to be remarked, that they are not always ſituated advantageouſly for the operation; for ſometimes they are found near the ventricles, and even ſometimes in the part oppoſite to the blow; ſo that when the blow has been on the ſuperiour part of the head, the abſceſs may be ſituated near the baſe of the *cranium*. Of this we have an example in *Pigray**, who gives us an account of a very ſmall abſceſs, which did not prove mortal till ſix months after the reception of the wound.

Remark on abſceſſes of the ſubſtance of the brain produced by a counter-blow.

When abſceſſes are formed in the part oppoſite to the blow, they generally produce ſome ſymptoms which may lay a foundation for making us ſuſpect them. We have already ſeen, under the article of the trepan, in dubious caſes, that many practitioners have with ſucceſs trepann'd in the part oppoſite to the wound. If when we trepan in the part where we ſuſpect a counter-blow, and find nothing either under the *cranium* or membranes of

* Liv. 4. Chap. 9.

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the brain, and if the ſymptoms which induced us to perform the operation, perſiſt after the trepan, we may conjecture that there is, in this part, a latent abſceſs in the ſubſtance of the brain.

The ſymptoms which lay a foundation for ſuſpecting a counter-blow, and from which we are induced to trepan, are principally a fixed pain, which, though not perceived at the part of the blow, nevertheleſs ſeems to be a conſequence of it. If irregular ſhiverings, a fever, and other ſymptoms ſupervene, we may preſume that an abſceſs is formed in the part of this pain.

The palſy, which often happens in ſimilar caſes, and which is generally found on the ſide oppoſite to the part of the brain which produces it, may, in conjunction with the pain, greatly contribute to determine the ſeat of the abſceſs; for if the palſy ſeizes the arm, the leg, or any other part on the ſide of the blow, we are almoſt ſure that the diſorder is on the oppoſite ſide. We have, however, ſome examples of palſies, whoſe cauſe is found in the brain on the ſame ſide with theſe palſies themſelves. But we ought not to confine ourſelves to theſe particular caſes, unleſs they diſcover themſelves manifeſtly. Thus when the palſy is accompanied with dangerous ſymptoms, we may trepan in the oppoſite ſide; and if we diſcover nothing, either under the *cranium* or the membranes of the brain, we may venture to make ſome ſmall inciſions in the ſubſtance of that organ, in order to aſſure ourſelves, whether there is not in the cortical ſubſtance, and even beyond it, ſome abſceſs which may be the cauſe of theſe ſymptoms. Such an inciſion is not to be dreaded, in order to ſave the life of the patient; and if this end is not obtained, the abſceſs will prove mortal independently of the inciſion. Neither is this practice to be dreaded with reſpect to the pain, ſince we have often

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ten obſerved that the proper ſubſtance of the brain is inſenſible.

Carcinomatous tumors which happen to the brain, and which are always fatal to the patient, no leſs deſerve the attention of the ſurgeon than the abſceſſes of which we have been ſpeaking; for the intolerable pain they cauſe, and which only ends with death, renders them inſupportable, and the attempts to remedy them are uſeleſs, becauſe we ſhall ſhew, in the following obſervation, that we almoſt never diſcover this diſorder till it has proved mortal.

Extirpation of carcinomatous tumors of the brain.

A man was afflicted with a violent and continual head-ach, which ſupervened a blow on the head, to which he paid no attention. This pain, notwithſtanding all the remedies uſed, perſiſted till the patient's death, after which there was found a carcinomatous tumor, as large as a hen's egg, which was formed in the ſubſtance of the brain. There are many examples of theſe terrible tumors, to be met with in the works of practitioners*. It ſeems, however, that the extirpation of theſe tumors is not always impoſſible, eſpecially when they are of a ſmall bulk, and ſituated on the ſurface of the brain; for the brain may ſuſtain ſimilar operations, ſince it often reſiſts very conſiderable wounds and gangrenes. Theſe tumors are not generally ſo large as that we have now mentioned. We have ſeen before, in the twentieth obſervation, the hiſtory of a long and violent head-ach, produced by two carcinomatous tumors, which were not much larger than a pea, and which adher'd to the cortical ſubſtance of the brain. Now if in an intolerable head-ach, whoſe event ſeems greatly to be dreaded, we ſhould either ſuſpect or diſcover a ſimi-

IX. Obſervation by M. *Coghlan*, on a carcinomatous tumor of the brain.

*Ephem. Dec. 2. an. 1. obſ. 167. Bonet, Sepulcr. Plater. Lib. 1. Fabr. Hild. op. chir. &c.

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ſimilar cauſe, it would be reaſonable to attempt the extirpation of the tumor, rather than cruelly abandon the patient to death, in a caſe where the operation is infinitely leſs to be dreaded than the diſorder. We may conceive the ſame notions of the funguſes which happen to the brain, as we do of theſe tumors, with reſpect to the extirpation.

Art furniſhes us with the ſame expedient againſt gangrenes of the brain; but, unfortunately, theſe are often found in the caſe of tumors, which are only diſcovered after death.

Amputation of a gangrened portion of the ſubſtance of the brain.

A woman of twenty two years of age ſtruck herſelf againſt a wall on the middle and ſuperior part of the parietal bone; the blow was not ſucceeded by conſiderable ſymptoms, neither did the patient ſpeak of her misfortune till ſome days after. She was ordered to be blooded, and uſe vulneraries only by way of precaution: ſhe was two months and an half without perceiving any other incommodity than a ſmall pain in the hinder part of the head. But at laſt ſhe was ſeized with a fever, and a pain of the whole head and abdomen. M. *Sauré* being called, examined her head, but found nothing externally: he ordered fomentations and veneſection, by which means the pains were diſſipated in ten or twelve days; but they ſoon appeared again, and continued till her death, which happened four months after the reception of the wound. The head being opened, there was neither any fracture in the cranium, nor any extravaſation on the membranes of the brain; but about three finger-breadths of theſe membranes had a livid colour, and when they were rais'd it was found that the ſubſtance of the brain was very black and gangrenous, to the depth of three finger-breadths. In wounds of the head where the *cranium* is open, or when

X. Obſervation by M. *Sauré*, on a gangrene of the brain.

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when a violent and fixed pain, ſucceeding a blow, determines to the trepan, we may perceive theſe gangrenes, before they have made too great a progreſs; and in this caſe we ought not to heſitate to remove all that portion of the brain which is affected with the mortification. *Lamberti**, a celebrated ſurgeon of *Marſeilles*, gives an obſervation on the ſame ſubject, which ought to be related, ſince it is a very inſtructive leſſon for ſurgeons.

A young man, of fifteen or ſixteen years of age, received a blow with a ſtone on the middle of the right parietal; the brain was wounded, and the patient next day fell into convulſions on the ſide of the blow, and into a palſy on the oppoſite ſide. Theſe ſymptoms were accompanied with a fever, a delirium, and a conſiderable diarrhœa; the ſubſtance of the brain became black, and there was applied to it a medicine compoſed of two portions of ſpirit of wine, and one of honey of roſes; the brain was inflated, and its ſubſtance ſofter than uſual, which made it neceſſary every day to cut the part of this gangrened ſubſtance which came out. On the eighteenth day, the patient fell from his bed, and all the ſubſtance of the brain, which roſe above the aperture of the bone, was by this fall detach'd, and found in the dreſſing; but the inflation continued to puſh out the ſubſtance of the brain, which was black, and it was cut off every day in proportion as it was protruded. On the thirty-fifth day, the patient drank ſo as to intoxicate himſelf, by which means the ſubſtance of the brain was more inflated, and bore conſiderably outwards: the patient being drunk, ſlipt his hand under the dreſſing, laid hold of the whole portion of this ſubſtance, and tore it away with violence. Next day the brain was found in a better ſtate, almoſt all the corrupted part of it was removed, and the ſur-

* Comm. ſur la Cariès, Chap. 5.

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ſurgeon could ſee nearly to the *corpus calloſum*: a red ſucceeded the livid colour, all the putrefaction was ſurmounted, and the patient cured. The palſy however remained, and he even became ſubject to epileptic fits, but his reaſon was entirely reſtored.

We may, therefore, after the example of this patient, entirely fulfil the indication which naturally preſents itſelf in ſimilar caſes. The timorous ſurgeon, who every day cut as much of this gangrene as appeared without the *cranium*, laboured to no purpoſe: corruption, which eaſily ſeizes the ſubſtance of the brain when it is gangrened, becauſe this ſubſtance is very ſoft and moiſt, muſt have more and more affected the mortified part left; and this mortified and corrupted part left, muſt have contributed greatly to accelerate the progreſs of the mortification. Thus there is a good deal of appearance, that the patient would have died, if he had not removed the cauſe of this progreſs, by tearing away almoſt all the portion of his brain which was gangren'd.

We have before given a great many obſervations, which prove that extraneous bodies may remain for a long time in the brain, without producing the death of the patient. But theſe obſervations, by teaching us that the preſence of theſe bodies does not always prove mortal, ought alſo to induce us to try their extraction, ſince ſooner or later they are almoſt always fatal to the patient. Theſe obſervations alſo prompt us to make the reſearches neceſſary to diſcover theſe bodies, when we have reaſon to ſuſpect, by the ſymptoms, the inſtrument, and the ſtate of the fracture in the *cranium*, that any of them are retained or concealed in the ſubſtance of the brain.

Extraction of extraneous ſubſtances retained in the ſubſtance of the brain.

A lady

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A lady, about thirty years of age, went to ſee ſome mortars diſcharged; but one of them burſting, a ſplinter of it ſtruck the middle lateral right part of the coronal bone. She fell backwards on the pavement without motion, ſenſation, or pulſe; ſhe vomited, and her ſenſes forthwith returned. This ſplinter had made a contuſed wound, with loſs of ſubſtance; there was alſo a fracture in the *cranium*, with ſplinters of the bone ſeparated. M. *de Manteville* extracted three of them, each of which was as large as the nail of the finger, and comprehended the two tables; beſides this wound, there was a tumor as large as an egg, with fluctuation near the back of the head on the poſterior and inferior part of the left parietal. M. *Manteville*, and M. *Deſportes*, who was called into conſultation, determined that it was neceſſary to open that tumor; but two other ſurgeons oppoſed it, and made a property of the patient, who was then without ſymptoms. On the ninth day ſhe was ſeized with a fever, and a delirium ſuperven'd, which was ſucceeded by a lethargy, and at laſt by death on the twelfth day. The ſurgeons of the *Chatelet*, upon opening her, found no extravaſation, but only a ſplinter in the ſubſtance of the brain oppoſite to the wound. By this, we ſee how much we ought to be upon our guard againſt extraneous bodies, which may enter into the brain, and eſpecially how attentive we ought to be, in fractures with cracks, to the ſplinters which may be lodg'd in the ſubſtance of the brain.

XI. Obſervation by M. *Manteville*, on a ſplinter found in the ſubſtance of the brain after death.

The many cures related in the beginning of this article, in order to ſhew the aſſiſtances of ſurgery in wounds, and other diſorders of the brain, ought not ſo to infatuate ſurgeons, as to make them forget the danger which accompanies wounds of the

Remarks on the danger of wounds of the brain.

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the brain, neglect the great caution which their treatment requires, and fail of circumſpection in the prognoſtic they ought to make of them; for it would not be difficult by other obſervations to inſpire at leaſt as much dread, as thoſe related give hopes of ſucceſs. But as it is on ſuch occaſions more eaſy to be afraid than to have too much courage, it will be ſufficient to relate the following obſervation, to counter-ballance thoſe which might inſpire too much boldneſs; it will alſo give us occaſion of making ſome remarks on the judgment which is too lightly paſſed in certain circumſtances with reſpect to wounds of the brain.

XII. Obſervation by M. *Marechal*, on a wound with a mortal ſuppuration.

A man, who received a blow on the head, had a ſplinter lodged about a finger-breadth deep in the ſubſtance of the brain. This wound forthwith produced very conſiderable ſymptoms; M. *Marechal* removed the piece of depreſſed bone, and dreſſed the bottom of the wound with Fioraventi's baum, and the external parts of it with a digeſtive. The patient was blooded ſix times, and there was the bulk of the yolk of an egg of the ſubſtance of the brain diſcharg'd: the ſymptoms were almoſt entirely diſſipated, the patient appeared indifferently well, the fever was moderate, and the wound in a hopeful ſtate: the ſuppuration every day carried off ſome portions of the ſubſtance of the brain, which were of a ſofter conſiſtence than that diſcharged firſt; there was a hole in the brain, ſufficient to lodge a tennis ball. On the ninth day M. *Marechal* reached his finger very gently to the bottom of this wound, in order to examine the fleſh, which appeared ill-condition'd. He ſays, the patient forthwith enter'd into ſuch violent convulſions, that he thought he was ready to die; the ſymptoms cauſed by this attempt were ſoon diſſipated, but the ſtate of the patient

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tient was not the leſs deplorable, for he died on the twelfth day. M. *Mareſchal* has given this obſervation, in order to advertiſe young ſurgeons that the danger is ſo great in theſe wounds, with loſs of ſubſtance by a great ſuppuration, that he never treated any of them with ſucceſs. Now ſuch a declaration from a ſurgeon of ſo much practice deſerves attention, but ought not to frighten us; for the obſervations we have related, and a number of others, permit us with reaſon to hope for a better ſucceſs.

Circumſtances which may augment the danger.

It is alſo to be carefully obſerved, that the danger often depends more on circumſtances, than on the wound itſelf; the temperament, the country, the care of thoſe who have the management of the ſick, and the events capable of exciting the paſſions, often determine the fate of the patient. It has been obſerved, for inſtance, that at *Montpellier*, *Marſeilles*, and *Avignon*, wounds of the head are more eaſily cured than at *Florence* and *Paris*. With reſpect to the paſſions, there have been patients ſeen, who have been ſuddenly cut off by a motion of anger; and the unexpected arrival of a perſon, either beloved or hated, has often produc'd the ſame effect: others have periſh'd for one ſingle act of incontinence, whilſt others have died at the interview of the perſon they were in love with: the want of a proper regimen has often as fatal effects. There are ſtill a great many other ſingularities which may prove equally noxious; *Fabricius Hildanus* informs us, that one of his patients died becauſe there was too great a noiſe made near him, and that a fine was exacted of the father for doing ſo. Authors are full of obſervations, in which they attribute the death ſubſequent to wounds of the head, purely to the circumſtances which have preceded them.

It

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It is not to be doubted but theſe foreign cauſes may often produce the death of patients; but it is alſo to be preſumed, that, for want of opening carcaſſes, we often attribute to apparent or external cauſes, that bad ſucceſs which is really the effect of ſome cauſe concealed within; a ſplinter, for inſtance, an abſceſs within the brain, a ſuppuration, ſuch as thoſe ſometimes formed after blows of the head, in ſeveral of the viſcera, and eſpecially in the liver, a ſuppuration retain'd, a gangrene, an inflammation, or an extravaſation. Now if any of theſe latent cauſes cut a patient unexpectedly off, when ſome remarkable conjuncture externally furniſhes an apparent cauſe of this unexpected death, we are apt to attribute to this external cauſe the fatal event which follows, ſince it is the only ſenſible cauſe which appears to have occaſioned it.

We are often deceived by apparent cauſes.

However, experience may inſpire us with ſome doubt with reſpect to theſe external cauſes, for it is certain they have not always ſo bad effects. Obſervators furniſh us with a great many facts on this ſubject, which ſeem to render theſe cauſes ſomewhat ſuſpected. *Salmuth** has, among others, related, that a man who had a very conſiderable wound in the brain was cured, though he was often drunk, and kept company with looſe women, who diverted him at leaſt by their gaiety and free converſation. Two things have induced us to quote this obſervation, or ſome other ſimilar one: 1. That we may have an occaſion to warn young ſurgeons, who may find ſimilar obſervations in authors, not to allow themſelves to be prejudiced by theſe bad examples, for fear of becoming negligent with reſpect to the precautions neceſſary to be taken in order to prevent theſe diſorders; for, notwithſtanding theſe obſer-

* Bonet, bibl. chir. cent. 5. obſ. 26.

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ſervations, which are truly extraordinary, it is not to be doubted but ſuch deviations are capable of preventing our ſucceſs in the cure of theſe great wounds. 2. We have a deſign to render ſurgeons careful not to allow themſelves to be deceived with reſpect to the cauſe of the terrible events which happen in theſe wounds, and which are attributed to accidental and exterior cauſes, whilſt ſometimes, for want of carefully examining the wounds and parts adjacent, we do not perceive the cauſes, which we might perhaps remove, and which nevertheleſs carry off the patient, without our ſo much as ſuſpecting their exiſtence. We could quote a great many obſervations, in which the aperture of carcaſſes has diſcovered ſuch latent cauſes, as have only proved fatal becauſe they were unknown to the ſurgeon.

M. *Marechal* has communicated to us an obſervation, which furniſhes us with an opportunity of pointing out a miſtake of another kind; it is indeed leſs dangerous than thoſe we have mentioned, but which is not leſs ſhameful to the ſurgeon who falls into it, and who is afterwards ſurpriz'd at his error. The ſubſtance of the brain is ſo ſoft, that the matter furniſhed by wounds of the head may ſometimes have a colour and conſiſtence like thoſe of the ſubſtance of the brain, and make it thought that the wound penetrates into this organ when it is no ways injur'd.

XIII. Obſervation by M. *Marechal*, on wounds of the ſuperciliary ſinus, in which a mucous matter was taken for the ſubſtance of the brain.

A man received a blow on the inferior part of his forehead, which made a wound that penetrated into the ſuperciliary ſinus. This wound, after the ſecond dreſſing, furniſhed flakes of a mucous matter, which the ſurgeon took for portions of the ſubſtance of the brain. M. *Marechal* diſcovered, that the wound did not paſs beyond this ſinus, and that

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the ſurgeon had taken the matter filtrated in this ſinus, for the ſubſtance of the brain. No doubt ſuch miſtakes induced *Muys* and *Nuck* to ſay, that wounds of the ſuperciliary ſinus ſo impoſe on ſurgeons, that they often believe the brain to be conſiderably wounded, when only the external table of the ſinus is fractured. The membrane which lines the ſinus may by reſpiration receive a motion which imitates that of the membranes of the brain, which may alſo concur to make it believed that theſe wounds penetrate through all the thickneſs of the *cranium*, when they only reach to the membrane of this ſinus. The wound mentioned by M. *Marechal* was very ſoon cured. This circumſtance engages us to conclude with a ſmall remark, ſomewhat foreign to our ſubject, but which we could not well omit; and this it is, that ſuch a ſpeedy cure evidently proves, that wounds of the ſuperciliary ſinuſes are not ſo obſtinate and difficult to be cloſed as is repreſented by authors, who partly for this reaſon forbid the application of the trepan upon them. But though it muſt be granted that this place is not proper for ſuch an operation, yet if any diſorder of thoſe ſinuſes themſelves*, or any other circumſtances require it, the difficulty of cloſing the wound ought not to hinder us from trepanning on that part.

Remark concerning the trepan on the ſuperciliary ſinus.

II.

We ſee, from the obſervations of the greateſt maſters, that we are but little fixed with reſpect to the remedies which ought to be employed in wounds of the brain, and that we have but little examin-

Remarks on the choice of remedies proper for wounds of the brain.

* For example, in the caſe of that cephalalæa mentioned by *Bartholin*, which was cauſed by ſmall ſtones retained in one of theſe ſinuſes. There are alſo ſometimes worms found in them, which produce the ſame diſorder.

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examined what thoſe are which muſt agree beſt in ſuch caſes. In the diſquiſitions of this kind, no mention is made of the particular indications which may be drawn from the proper ſubſtance of this organ: ſome have uſed vinous ſpirits, and even ſpirit of wine itſelf; and others ſpirituous baums impregnated with ethereal oils, and alcolized or vinous oils: ſome have employed the honey or ſyrup of roſes, and others the tinctures of myrrh and aloes: ſome have had recourſe to ethereal oils alone, ſuch as the oil of turpentine, whilſt others uſe oil of olives, with St *John's* wort, or ſome other vulnerary plant infuſed in it; and ſome have retain'd dry lint alone. None of theſe practitioners can render a reaſon for his preferring one remedy to another. It muſt however be confeſſed, that the brain has been looked upon as a ſpermatic or exſanguine part, and that the remedies moſt proper to a part of this kind, eſpecially a nervous part, have been appropriated to it. But there is an inconvenience to which the brain is ſubject, which may be eaſily remarked, and to which we ought to be very attentive in wounds of that organ with ſuppuration; this is, an inflation of the ſubſtance of the brain, which is difficult to repreſs, and by which this ſubſtance tends to diſcharge itſelf in ſuppuration. M. *Marechal* and other great practitioners have often remarked this inconvenience, and it has been obſerved, that ſpirit of wine, though often employed with ſucceſs in wounds of the nerves, may contribute a great deal to this ſymptom. M. *de la Peyronie* has given an obſervation on this ſubject, and experiments, wherein we very ſenſibly perceive the troubleſome effects of theſe inflations, and the remedies moſt proper to oppoſe them.

Inconvenience which happens in wounds of the brain.

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XIV. Observation by M. *de la Peyronie*, on an inflation of the brain with an excessive suppuration.

A young man, of sixteen or seventeen years of age, was struck with a stone, which made a wound with fracture and splinters in the middle of the left parietal bone. He was trepan'd, in order to remove the splinters which wounded the membranes of the brain: An abscess under these membranes superven'd. M. *de la Peyronie*, who pierced this abscess, perceived that the matter had, in some measure, insinuated itself into the anfractuosities of the brain, and that it had made some impression on the substance of that organ; for, he there observed already some appearance of putrefaction. He thought it proper to apply spirit of wine to this part, as a remedy proper to resist the putrefaction; but at the end of two days there supervened an inflation, which rose above the aperture of the *cranium* externally, notwithstanding the dressing which opposed it. This inflation was accompanied with so prodigious a discharge of matter, or a suppuration, that it cut off the patient in a few days. It appeared, by the quantity of matter discharg'd, that half of the brain had been evacuated in form of soop during this suppuration. M. *de la Peyronie*, upon opening the head, was surprised to find that the loss of the substance of the brain did not nearly correspond to that which had been discharged. From this he understood that the substance of the brain had been far from furnishing the whole matter of this great suppuration, and that the juices which moisten it had formed the greatest part of the matter.

Experiments on the properties of medicines generally employed in wounds of the brain.

M. *de la Peyronie* having frequently observed that spirit of wine had not succeeded in these inflations, or rather suppurations, of the brain, and that, on the contrary, this liquor appeared to excite them more, judg'd it proper

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to make the following experiments, in order to resolve his own doubts, and to discover the kind of remedies most proper to repress these inflations. He put one portion of the brain in spirit of wine, another in wine, another in the baum of *Fioraventi*, another in oil of turpentine, and another in the *commanders* balsam. That in the spirit of wine was rarefied, and rendered considerably more tender: It also, afterwards, corrupted sooner than the others. The same changes also happened to that in the wine, but they were much less considerable. The portion, on the contrary, in the baum of *Fioraventi*, became a little more close and firm. This last effect was still more sensible in those portions which were in the oil of turpentine and the *commanders* balsam.

These experiments sufficiently evince, that essential balsamic oils are preferable to alcoholiz'd oils, in order to repress and prevent these suppurations of the brain. M. *de la Peyronie* has since observed that practice perfectly with these experiments.

Honey of roses is also a very common remedy in wounds of the brain, and it has been long authoriz'd by practice, in cases where a detersion is necessary, especially when the suppuration is obstinate, and the matter of it thick. Some practitioners have looked upon it as a remedy too hot and acrid for this part, but *Scultetus** has destroy'd this prejudice by experience. M. *de la Peyronie* used this remedy very advantageously in making injections into the brain, for which reason we shall relate this cure, very succinctly, because it is already described at length by some authors.

This observation, so famous, as well on account of the greatness of the disease, as the singularity of the cure, includes the history of a wound on the left pa-

Prodigious suppuration of the brain cured by injection.

* Arcen. de chir. *page* 127.

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rietal, for which M. *de la Peyronie* was not called at firſt. The patient had laboured under it more than a month, before he ſaw it for the firſt time: the ſymptoms which had ſupervened ſome days before, and which had laid a foundation for calling M. *de la Peyronie*, made him ſuſpect an extravaſation under the *cranium*. He examin'd the bone, and diſcover'd a fracture, with many cracks diverging from a common center: next day, he applied two crowns of a trepan, and removed the pieces of bone which wounded the *dura mater*. This operation did not remove the ſymptoms, and the *dura mater* was a little ſoft and livid, which determined M. *de la Peyronie* to open that membrane. There was forthwith diſcharg'd, from the aperture, about a porringer full of ill-condition'd pus, in which were perceived ſome flakes of the ſubſtance of the brain. It was alſo found, that the cavity in which this pus was lodged, extended to the *corpus calloſum*, and was capable of containing a hen's egg. The matter which continued to ſuppurate, was very pinguious and thick. M. *de la Peyronie* judged it proper to dilute and remove it, in order to make injections into the cavity with honey of roſes, diluted with a decoction of cephalic plants. This cavity was ſo conſiderable, as to contain four ounces of the injected liquor; in proportion as the cavity was filled with the injection, the patient loſt his ſenſes, and appeared to be dead, but his life was forthwith reſtored by removing the liquor. Theſe injections carried off, with the purulent matter, ſmall portions of the ſubſtance of the brain, which went into ſuppuration. The great advantage ariſing from theſe injections, was to hinder the matter from continuing there, and acquiring, by ſtagnation, a putrid character, which would have entertained and augmented thoſe putrid ſuppurations, till the patient had died; whereas, by theſe

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theſe injections, the ſuppuration aſſum'd a laudable character, and the patient was cured in leſs than two months. M. *de la Peyronie* has in ſimilar caſes often employed injections with the ſame ſucceſs. If the matter had appeared affected with a putrid diſſolution, and if the ſubſtance of the brain had greatly partaken of this diſſolution, it would have been neceſſary to have added the *commanders* balſam, the oil of turpentine, or ſome other balſamic and ſpirituous ſubſtances, to the injections. The injections muſt neither be thrown in with force, nor through too ſmall a ſyphon; on the contrary, the pipe through which they are conveyed ought to be large and terminated, like that of a water-pot, that the liquor may extend itſelf farther, waſh better, and make a ſmaller effort on the ſubſtance of the brain. When there is neither tenacity nor diſſolution in the ſuppurating matter, we may uſe the baum of *Fioraventi*, either alone, or mixed with honey of roſes diluted in ſome vulnerary liquor. We have a great many obſervations, in which we find that this preparation has been ſucceſsfully uſed in wounds of the brain. Thoſe injections which are only made between the *cranium* and *dura mater* require leſs circumſpection, ſince in a ſimilar caſe we find that *Paré** with ſucceſs uſed decoctions of deterſive plants.

* Lib. 10. Cap. 21.

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MEMOIR VIII. *By M. de la* PEYRONIE.

Observations, with Reflections, on the Cure of Hernias with Gangrene.

SURGEONS have recourſe to different methods of preventing the fatal effects of hernias with gangrene, but this part of practice is not reduced into method, ſince every one confines himſelf to the method which his genius inſpires. The authors who deſcribe manual operations, do not always foreſee the indications which preſent themſelves in extraordinary caſes, neither do they perceive all the means of relief, which theſe indications may ſuggeſt to the patient. Such ſingularities can only be at firſt communicated by practitioners, who have obſerved them, and had recourſe to particular means which have ſucceeded with them. In a word, without the obſervations which have been communicated to the academy, and which ſhall be related in another *memoir*, we ſhould be almoſt entirely ignorant of the happy attempts which many great practitioners have made in hernias with mortification, in order to ſtop the progreſs of the putrefaction, retain the gangren'd part of the inteſtine without, and procure the adherence neceſſary for the ſucceſs of the operation. Theſe attempts would, for the moſt part, be as much unknown to us, as thoſe the antient ſurgeons made, with the ſame ſucceſs, in the ſame circumſtances; for it ſeems, that the ſingular proceedings which depend on the ſkill of the operator, muſt have been, at leaſt in ſome degree, practiſed by the great ſurgeons in former ages, and that if there had been ſocieties, as at preſent, to receive the obſervations of each of theſe maſters, to make uſe of them in practice, and to communicate them to the public,

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public, we ſhould ſee that the antient ſurgery was not ſo limited as it appears. But be this as it will, theſe procedures, which have only been known by thoſe who have practiſed them, can only be looked upon as private diſcoveries, which have in nothing contributed to the progreſs of our art, ſince they have not been tranſmitted to poſterity. Thus we have a right to place, among the claſs of diſcoveries which we fix and communicate to the public, a great many points of practice, which are, perhaps, very antient. Such, among others, are the different means we have contrived to reſtore the gangrened inteſtine in the operation for hernias with mortification, and procure it the adherence which is neceſſary for its reunion. The Royal Academy of Sciences, in 1723, ſpeaks of a method which ſucceeded with me very happily in the operation for an hernia of this kind: I have ſince had recourſe to the ſame method with like ſucceſs in a diſorder of an almoſt ſimilar nature: I ſhall exactly relate the hiſtory of the diſorder, and of the operation, a detail of which has not as yet been given; I ſhall afterwards make ſome remarks on the care to be taken by the patient and ſurgeon in theſe hernias, and on the ſtate in which the affected parts ought to be, in order to the ſucceſs of the cure.

I. Obſervation by the author, on the manner of reſtoring the inteſtine in hernias with gangrene.

A man of thirty years of age had his right teſticle and the ſpermatic chord very much ſqueezed by a fall. The inflation of theſe parts, the pain, and the fever were violent. He was perfectly cured, except ſome inflation of the teſticle and ſpermatic chord, which remained much larger than in a natural ſtate. Three years after the inteſtine fell out of the ringlet on the ſame ſide. This deſcent was perfectly retained by a truſs, till the patient was ſixty one years of age; then

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then the inteſtine began to inſinuate itſelf under the bandage. At the end of two years there was a ſtrangulation, which having not been reduced, was ſucceeded, after the firſt ſymptoms which generally accompany theſe diſorders, with a *miſerere*, and a gangrene of the inteſtine. In a few days the gangrene communicated itſelf to the herniary ſack, to the fat and ſkin, ſo that all theſe parts, being opened by the putrefaction, gave vent to the fæces, as it were through a watering-pot. The gangrene had alſo reached to the teſticle and ſpermatic chord, which had remained tumefied and diſorder'd from the firſt accident, in which, as we have ſaid, they had been violently bruiſed. To prevent the diſorder, which muſt have cauſed putrefaction, and which might have been augmented by the matter of every kind which was lodged in the tumor, I open'd this tumor from the ringlet to the bottom of the ſcrotum. I found the ringlet very much dilated by the inteſtines and the chord of the teſticle. The ſtrangulation, which had produced theſe ſymptoms, was relaxed by the gangrene of the inteſtine. I perceived, with my finger, that it extended above the paſſage, which induced me, in order to remedy this misfortune, to dilate this paſſage. I drew out the inteſtine, which I found gangren'd more than two inches above the ringlet. It came ſo eaſily, that I readily perceiv'd that it was not retained by any adherence. I removed all that appeared gangrened, and paſt hopes of becoming alive. To render myſelf maſter of the two ends of the inteſtine, which might have enter'd the *abdomen*, and produc'd ill effects, I paſs'd a needle and thread through the meſentery, and made a fold in that part, to bring the two ends of the inteſtine together, and ſecure them oppoſite to each other. Afterwards in tying the thread, I formed a loop capable of retaining the bundle of parts,

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parts, which I wanted to hinder from entering too far into the cavity of the *abdomen*; this favour'd the diſcharge of the fæces, and of the matter furniſhed by the ſuppuration.

The ſpermatic chord and teſticle being gangrened, it was neceſſary to remove them. This I did, notwithſtanding the largeneſs of the chord, which was two inches in diameter at the part where I tied it. I could not tie it above this largeneſs, becauſe it extended too far into the belly.

I ſeparated the loop which retained the meſentery, from the ligature of the ſpermatic chord, in order to avoid confounding them in the ſubſequent dreſſings. I moiſten'd the wound with ſpirit of turpentine, which I continued to uſe in the other dreſſings, dipping doſſils and pledgets in it, to be apply'd to the parts where any putrefaction remained; for it is the moſt powerful remedy I know againſt all kinds of putrefaction. But it is, particularly, in putrefactions which happen in the *abdomen*, which are by the fæces rendered more rapid and difficult to oppoſe, that this remedy is extremely advantageous, by the efficacy and expedition of its operation, ſo that it cannot be too much recommended in theſe putrefactions. I preſs'd gently on the ligature of the ſpermatic chord, and, laſtly, dreſſed the wound where the ends of the inteſtine were ſecured. The reſt of the wound was dreſſed with a flat dreſſing.

Very ſoon after the operation, the ſymptoms were diminiſhed, and the diſcharges were free and copious. On the twenty-fifth day after the operation, the ligature on the ſpermatic chord being a little relax'd by the diminution of the chord, and a fungus as large as a hen's egg, which appeared to be carcinomatous, appearing in a ſhort time below the ligature, I cut the former ligature, become uſeleſs by its relaxation, made a new one very

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very tight, and remov'd the fungus. This laſt ligature was ſeparated on the eighth day; then the thread which formed the double of the meſentery was alſo detached, and the two ends of the inteſtine adher'd to the internal ſurface of the ringlet. A few days after, the fæces were divided; a few of them were diſcharged by the wound, and the reſt paſſed into the inferior part of the inteſtinal canal, and the patient afterwards went to ſtool in the ordinary manner, when he managed prudently.

The wound continued to cloſe every day, but more or leſs according to the regimen. If the patient augmented his nouriſhment, the wound opened again, and diſcharged more ſuppurated matter and fæces; but if he fed ſparingly, the wound was dried, and furniſhed leſs matter of every kind. In a word, it could not be cured ſooner than four months, after the patient had, for about three weeks, reduced himſelf to a very ſpare diet, of eaſy digeſtion.

Six months after the wound was perfectly cured, the patient, towards the center of the cicatrix, felt pungent pains, which were ſucceeded by an abſceſs as large as a filberd, which open'd without the aſſiſtance of art. It furniſh'd pus in a ſmall quantity, ſome portions of very moiſt fæces, and a ſmall pointed bone which the patient had ſwallowed, and which had no doubt been the cauſe of this abſceſs. In the courſe of two months employed in cloſing up this ſmall hole, ſometimes wind, and ſometimes moiſture was diſcharged from it, but the cicatrix formed, remained ſolid, and ſtood it for many years.

However, by little and little, there ſurvened, in the part of the cicatrix, a new hernia, of the bulk and figure of a pine-apple, whoſe baſe towards the ringlet was very large, in oppoſition to ordi-

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ordinary hernias. To prevent its being enlarged, the patient wears a bandage, whoſe cuſhion is only a parcel of ſilk folded up flat and quilted, but without that protuberance which the cuſhions of ordinary have. This new hernia is not the only ſymptom which ſuperven'd ſince the ſmall abſceſs we have mention'd, for the patient is ſubject to a colic, almoſt like that ſpoken of in the hiſtory of the Royal Academy of Sciences at *Paris* in the year 1723. This colic proceeds probably from the obſtacle the fæces meet in paſſing through the inteſtine, ſomewhat ſtrangulated by the cicatrix. This obſtacle is ſtill augmented by the flexure which the inteſtine makes at the place of its adherence with the internal ſurface of the ringlet, where it always remains fixed. The impreſſion of the excrements on the new and delicate fleſh might have, at firſt, alſo contributed greatly to the production of this ſymptom. In a word, we may look upon the acrimony of theſe excrements, as a determining cauſe of theſe excrements, ſince, very ſoon after the patient is ſeized with them, he is obliged to go to ſtool.

But in theſe caſes it generally happens, that in proportion as a patient uſes more ſolid aliments, or in a larger quantity, the cicatrix is relaxed and extended, as I have frequently obſerved. The diameter of the inteſtine is enlarged, the fleſh loſes its ſenſibility, and the colics become much ſhorter, and leſs painful.

If, in order to obtain a ſpeedy and ſolid cicatrix, we muſt, as before obſerved, reduce the patient to a very ſmall quantity of light food, we ought alſo, only gradually and ſlowly, to increaſe the quantity of aliments for a long time, in order to prevent theſe colics, and preſerve the cicatrix. We ought alſo, above all things, to guard againſt indi-

Precautions required in the cure of hernias with gangrene.

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indigeſtions, which, as we ſhall ſee in the following obſervation, are extremely dangerous in theſe caſes.

II. Obſervation by the author on an indigeſtion which proved mortal in conſequence of an hernia with putrefaction.

A woman, of about twenty-ſeven years of age, had labour'd about three years under a crural hernia, brought on by the efforts of child-bed labour. There was a ſtrangulation, which the patient concealed for three days, but at laſt a vomiting and other ſymptoms obliged her to diſcover the cauſe of all theſe effects. The operation was propoſed to her, and ſhe was twenty-four hours before ſhe agreed to it. At laſt it was perform'd, though there were but ſmall hopes of ſucceſs.

As ſoon as the ſkin and hernial ſack were open'd, it was found that about two inches of the inteſtine was affected with putrefaction, through which very fluid fæces were diſcharg'd abundantly. After about a pint and an half of them were evacuated, the patient, who before was in violent pain, was reliev'd. The ſack was clean'd, and waſh'd with a mixture of wine and aqua vitæ. It was thought ſufficient to apply to the gangren'd inteſtine, a pledget dipt in ſpirit of turpentine. The reſt of the wound was ſoftly dreſſed with dry lint, and compreſſes dipt in wine, animated with aqua vitæ.

Three hours after, it was perceiv'd that the diſcharge of matter had moiſten'd the whole dreſſing, which was chang'd, and it was even neceſſary for fifteen days to renew it four or five times a day. At the end of this time, the whole ſtrangulated and gangren'd part of the inteſtine was detach'd by a ſuppuration. Though the matter of the inteſtine continued to be evacuated from the wound, yet the fleſh was of a good quality. There was a laudable ſuppuration eſtabliſhed, and the cicatrix began to be form'd. At the end of fifteen days, a part of the fæces was diſcharg'd in the natural man-

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manner, and none of them were any more eliminated through the wound. About a month after they were regularly evacuated, and the cicatrix was ſoon compleated.

The very ſevere regimen obſerved by the patient had, no doubt, a great ſhare in this cure, which was neither interrupted nor retarded by any ſymptom; but two months after a perfect cure, the patient had ſome indigeſtions, in conſequence of which ſhe was afflicted with very violent colics: at laſt ſhe had a very conſiderable indigeſtion, which was ſucceeded by vomitings, with violent efforts. In one of theſe efforts, ſhe felt a very intenſe pain about the cicatrix of the wound made for the cure of the hernia. Her *abdomen* became more and more painful; at laſt it became prodigiouſly tenſe, and the patient died on the ſecond day. On opening the *abdomen*, it was found full of very thin fæces. The extravaſation probably began to be made, when the patient felt that intenſe pain about the cicatrix, and it was ſix hours in making; from the time ſhe felt the pain, ſhe diſcharged no fæces by the anus. On ſearching for the aperture of the inteſtine through which the extravaſated matter had paſſed, it was found near the ligament of *Fallopius*, where the two portions of the inteſtine had adher'd and eſtabliſhed their communication. The inferior portion had remain'd entire, and continued adherent to the part of the *peritonæum* which lin'd the ligament. The ſuperior portion was torn at the part where it was attach'd to the *peritonæum*, the aperture form'd a kind of mouth, about eight lines in length, and two or three in breadth. This portion of the inteſtine was very much collapſed.

That

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That the cure of hernias of this kind may succeed, it is neceſſary that the gangrene of the inteſtine be confined near the ringlet; for if it reaches internally, it may extend along the inteſtinal canal, infect the meſentery, and prove mortal, as well as all other internal gangrenes to which no remedy can be applied. It is alſo to be obſerved, that the ſuperior branch of the inteſtine being putrified, it will open, and fill the *abdomen* with fæces, which are known to be very copious on theſe occaſions, becauſe they are accumulated on account of the ſtrangulation, which is ſufficient to prove mortal, as we ſee by the following obſervation.

Conditions neceſſary for the cure of hernias with gangrene.

A man of thirty-five years of age died of an hernia, whoſe ſtrangulation happen'd ten years before. Upon ordering his body to be open'd, I found, below the ſtrangulation, about ſix inches of the ilium gangren'd, without any extravaſation in the herniary ſack, except about two ſpoonfuls of a liquor of a dark red colour, and of a very cadaverous ſmell: about three inches of the inferior portion of the ilium were gangren'd, but the gangrene of its ſuperior branch extended more than a foot into the *abdomen*. About three inches above the ringlet, this branch of the inteſtine had four or five holes, occaſioned by putrefaction. There were in the cavity of the *abdomen*, four or five pints of an extravaſated liquor, of an inſupportable ſmell, and as black and thick as coffee. If the operation had been perform'd before the gangrene had ſeiz'd the inteſtine, or at leaſt before it had reach'd far above the ringlet, and if in this laſt caſe the ends of the inteſtine had been retain'd, as we have ſaid, the patient's life might have been preſerv'd.

III. Obſervation, by the author, on an extravaſation of fæces in the *abdomen*, which proved mortal.

It is alſo neceſſary, for the perfect ſucceſs of operations

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ſations for hernias of this kind, not only that the gangrene has not made, above the ringlet or paſſage of deſcent, ſuch a progreſs that we cannot ſufficiently retract the two ends of the inteſtines to retain all the mortified parts without the *abdomen*, but it is alſo requiſite that each end of the inteſtine ſhould contract, beyond its gangren'd part, an adherence to the ringlet, or near the ringlet, by which theſe ends may re-unite, or form a communication, that the fæces may paſs from the one to the other, and follow the ordinary road. Now a ſurgeon is ſometimes depriv'd of this advantage, for the means uſed for facilitating this adherence do not always ſucceed. If on theſe occaſions the gangren'd part of the inteſtine ſeparates naturally from that which is ſound, or if it is cut off, without the precaution to retain the two portions of the inteſtine, either one or both of them may return by the ſpring of the meſentery to which the inteſtine adheres, or by ſome other cauſe; and if theſe two portions return for want of adherence, and remain as it were floating in the *abdomen*, the ſuperior branch will diſcharge into the *abdomen* the matter convey'd to the ſtomach, and this extravaſation will prove mortal; for in this caſe it is eaſily perceived, that it is almoſt impoſſible that theſe branches ſhould be ſecured, ſo as to join each other by adhering to ſome of the adjacent parts. It is alſo evident, that the ſame misfortune muſt ſtill happen, though the inferior portion of the inteſtine remains adherent, if the ſuperior portion, as we have ſaid, diſcharges its contents into the cavity of the *abdomen*.

But if the inferior branch is drawn inwards, and cannot join the ſuperior, the misfortune is ſtill leſs, provided this ſuperior branch adheres to the ringlet; for in this caſe the fæces will be diſcharg'd from the ringlet, where there will be a perpetual anus.

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We ought, however, to endeavour to avoid this laſt inconvenience, by attempting the adherence of the inferior portion to the margin of the ringlet, inſtead of tying it, or allowing it to return into the *abdomen*. By this precaution we may, as we have ſeen in the firſt and ſecond obſervation, prevent a diſagreeable and ſhocking incommodity, which laſts all the remainder of the patient's life.

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MEMOIR IX. *By M.* PETIT.

Deſcription of a complicated Tumor, ſituated on the Trachea Arteria, *near the* Sternum; *with Remarks on the Nature and Cure of this Tumor.*

A Lady of forty years of age, very regular in her method of living, and of a pretty robuſt conſtitution, was attack'd with an extinction of voice, almoſt ſuddenly, and without any apparent cauſe from the ſeaſon, which was then temperate. She had recourſe to the drinks commonly uſed on theſe occaſions, which ſhe took warm, and in large quantities. She did not obſerve a very ſevere regimen, during the eight or ten days ſhe was her own phyſician. Her indiſpoſition continuing, ſhe applied to perſons more ſkilful, who order'd her to be blooded in the foot and arms, and then in the throat. She was reduc'd to an exact regimen, and took the remedies ſeemingly the beſt indicated, notwithſtanding which ſhe was not relieved. The temperate ſeaſon was ſucceeded by a heat, ſo conſiderable, that the patient not only ceaſed to drink warm liquors, but alſo drank the coldeſt water ſhe could find. Upon the firſt day of her uſing this, ſhe ſpoke ſo well, that ſhe could not hold her tongue. Such an accident procur'd this ſpecific a reputation, which did not laſt long; for a few days after, her voice was extinguiſh'd afreſh, and the drinking warm liquors reſtor'd her to a facility of ſpeech, but indeed the effect of the warm was not ſo ſpeedy as that of the cold water.

State of the diſorder.

In this ſtate I ſaw the patient for the firſt time; I examin'd her mouth and throat, in which there was a ſlight phlogoſis: what I further obſerved,

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though ſhe did not complain of it, was an inflation under the thyroid gland, near the *ſternum*. This inflation form'd a ſoftiſh tumor, as large as a ſmall egg; but I did not then dread any terrible conſequences from it, becauſe the lady inform'd me that ſhe had perceiv'd it in the ſame ſtate in which I ſaw it, after the delivery of a child, about ſix years before the extinction of her voice. I was ſatisfied with preſcribing for her the general remedies, and then chalybeate mineral waters, which reliev'd her. She quitted theſe for the uſe of milk, which was ſucceeded by a return and augmentation of the diſorder. During four months, ſhe would take no remedies but ſuch as were ſuggeſted either by her own caprice, or the advices of her friends; but none of them did her any ſervice.

She conſulted me afreſh, and inform'd me, that for two months ſhe had labour'd under a quartan fever; that for ſix weeks ſucceſſively, ſhe had regularly, though without ſucceſs, taken all kinds of febrifuges, and that the fever had not left her till fifteen days after ſhe ceas'd to take any remedies. Her tumor, whoſe bulk was not diminiſh'd, was become much harder, had aſſum'd a reddiſh brown colour, and was pretty painful. The ſkin, which had always been moveable, became adherent in a very inconſiderable point: there was alſo a very apparent fluctuation. Though the extinction of her voice was leſs than it had been ſome time before, yet I judg'd that her diſorder might be dangerous, unleſs it proceeded from a cauſe which I ſuſpected from the irregular life of her huſband, and from ſome of the diſorders with which I had known her afflicted.

The tumor depended on a venereal cauſe.

After an exact ſcrutiny, and ſincere accounts from both huſband and wife, my doubts were clear'd up. Being aſſured that the cauſe was venereal, I ordered

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ordered mercurial frictions to be made according to the ſtate of the diſorder, and the exigencies of the patient, who was not eaſily govern'd. All I could ſay to ſupport my ſentiment, could not convince the patient. A quack had promis'd to cure her, upon which ſhe committed herſelf to his care, ſo that I was five or ſix months without ſeeing her; but being reduc'd to a deplorable ſtate, ſhe applied to me for the third time. Her tumor was almoſt entirely deſtroy'd, either by the troches the quack had uſed, or by the putrefaction which had ſuperven'd. The ulcer was black, fetid, and as large as a crown; three cartilages of the *trachea arteria* bounded the bottom of it, and her voice had not return'd: a frequent cough, purulent ſpits, watchings, a flow fever, and a conſiderable extenuation, render'd this diſorder much more important and dangerous than it was before. However, I had the courage to propoſe the remedy ſhe had before rejected, but to which ſhe now conſented, though with a great deal of reluctance.

The tumor degenerated into an ulcer.

The preparations were not ſo long as I could have wiſh'd, becauſe the cough, which became inſupportable, oblig'd me to deſiſt, in order to adminiſter the ſpecific. The frictions conſiſted of two drams, one half mercury and the other hogs lard; the two firſt, uſed at thirty-ſix hours diſtance from each other, appeaſed the cough a little; the third friction was forty-eight hours from the ſecond, becauſe the mouth had already ſome ſmell, and the ſalivation began to be eſtabliſh'd. Though the cough was more ſupportable, it was nevertheleſs very frequent and redoubled, eſpecially during the dreſſing of the ulcer, and a little before dreſſing it. The ſpits thrown up in coughing were much more fetid than the matter of the ſalivation; however,

Specific cure of the diſorder.

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the ulcer began to be deterg'd, and diſcover'd, almoſt quite bare, four or five lines of the external ſurface of one of the cartilages, and the edges of the two adjacent ones. I judg'd that they would exfoliate, at leaſt in ſome meaſure; and I was convinced when I ſaw the fleſhy and membranous fibres, which fill up their intervals, fall into putrefaction; but eſpecially when a portion of the membranes which cover them internally was ſeparated, and diſcharg'd at ſeveral times with the ſpits. The patient evacuated a flake of this membrane, as large and thick as a ſix-pence, which was ſeparated whilſt I dreſſed the ulcer, and eliminated with a great deal of difficulty, becauſe the ſuperior interval of the ringlet, which was a little uncover'd, allow'd a portion of the air to enter; and it was only after ſtopping this hole with my finger, that all the air paſſing through the glottis, had force enough to expel this flake with the ſpit which ſurrounded it. The aperture between the two ringlets augmented in a ſhort time. The ſeparation of the putrefied part produced the ſame effect in the interval below, ſo that this ringlet being alone, and entirely uncover'd, became dry; afterwards a portion of it about four or five lines in length exfoliated, and left an aperture capable of containing the point of the finger. The edges of the two adjacent ringlets did not exfoliate, or at leaſt their exfoliation was inſenſible.

Treatment of the ulcer.

In the firſt dreſſings, in order to reſiſt the putrefaction, I waſhed the ulcer with the tincture of aloes, mixed with a ſolution of camphire; but afterwards the *trachea arteria* being open'd, I did not apply this lotion, except with an expreſs'd tent, to hinder it from flowing into the *bronchia*, becauſe this remedy, though uſeful againſt putrefaction, might have excited a mortal cough. Beſides, as I was afraid

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leſt in inſpiration the air ſhould carry ſome part of the dreſſing inwards, I ſubſtituted, inſtead of the doſſils and pledgets, a ſingle bundle of ſoft lint, cover'd with a fine linnen cloth, with which I fill'd the ulcer; I dipt it in ſtorax and baſilicon, pretty warm, that it might be impregnated by them. I allow'd it to cool and become fix'd, that nothing might be ſeparated from it, and as it was ſtill ſoft, it yielded to the ulcer ſo much the better, becauſe it was a little preſſed by a *Nuremberg* plaiſter, which going round the neck once and an half, retain'd it better than any other bandage would have done. After the removal of the whole putrefaction, the cough diminiſh'd daily, and at laſt ceas'd entirely, except in the time of the dreſſings, when it was pretty violent; but it ceas'd almoſt as ſoon as the dreſſing was applied. I then uſed my deſiccative, and when the fleſh appeared granulated, only uſed pompholyx melted and pretty warm, in which I dipt the bundle of lint, which I always retain'd with the fore-mention'd ſpecies of emplaſtic bandage.

On the fifteenth day of the ſalivation, the evacuations, which began to be diminiſh'd, were augmented by a fourth friction, and then by a fifth, each of two drams. At laſt, on the twenty-ſecond day of the ſalivation, and twenty-ſixth after the firſt friction, I purg'd the patient for the firſt time. She had all along had a due ſolubility of body. I order'd her to be waſh'd, and have her linnen changed. She was purg'd every other day, till the thirty-ſecond. Her ſtrength and fleſh were reſtor'd, ſo that ſhe had no more occaſion for my aſſiſtance, if her ulcer had been cured.

Though there remained, in the *trachea arteria*, two holes, one above and another below the denudated cartilage, we might have ſaid, ſtrictly

Exfoliation of the cartilage of the *trachea arteria*, diſcover'd by the ulcer.

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ſpeaking, that this ulcer was cur'd, ſince it diſcharg'd no matter, and all its circumference was cover'd with a very ſolid cicatrix, which united the ſkin and interior membrane of the *trachea arteria*. For fifteen or twenty days I waited with patience, till nature ſhould procure an exfoliation of this cartilage, when a meſſenger came to tell me that the patient was ſeized with a violent and obſtinate cough. I found her in a deplorable condition, out of which I forthwith took her, as ſoon as I knew the cauſe of it. The portion of the cartilage, which had exfoliated by one of its ends, had paſſed into the cavity of the *trachea arteria*, in ſuch manner, that, both in inſpiration and expiration, the air made it move like paper ill-paſted on a window, which the wind cauſes to tremble. I took it in my forceps, and tried to ſeparate it entirely at its other end, but its adherence was too ſtrong. I tied it with a thread, not only to remove the cough, but alſo to prevent a more troubleſome ſymptom, which would have infallibly happen'd, if in the total ſeparation the whole piece had fallen into the *arteria trachea*. The thread with which I tied it was pretty long, and retain'd by the circular plaiſter in ſuch a manner, that it pull'd the cartilage a little outwards, as well to keep it from falling again into the *arteria trachea*, as to accelerate its ſeparation. Three days after the exfoliation was compleat, and the lips of the aperture left by the loſs of ſubſtance were cicatris'd in all their extent. This aperture was exactly round, and ſo large, that when it was not ſtopt, little or no air paſs'd through the glottis, either to enter into the breaſt or come out of it. The inſpiration and expiration, made through this hole, were accompanied with a certain diſagreeable noiſe, which made thoſe who heard it incline to cough; but this noiſe continued only till the aperture was clos'd up by the dreſſing.

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As her ſtrength and fleſh were perfectly reſtor'd, I thought of nothing but to remedy the total defect which ſubſiſted, and of which the patient complain'd greatly. We may eaſily conceive that it was impoſſible that nature ſhould regenerate fleſh, capable of cloſing up this aperture; and that all which could be expected from art, was to contrive an inſtrument of the ſame nature with the obturator of the palate. This I did with ſucceſs, by means of a pellote of ſoft lint, wrapt up in linnen. This pellote, much leſs than thoſe I uſed in dreſſing the ulcer, was dipped in wax and ſperma ceti, melted with each other, and pretty warm, ſo that the whole pellote was impregnated with it. Having allow'd it to cool ſufficiently, though it was ſtill ſoft, I applied it to the part, and it filled it ſo exactly, that, without paſſing into the internal part of the *trachea*, it exactly clos'd up the paſſage of the air. As in all the dreſſings the *Nuremberg* plaiſter had ſucceeded to retain the pellote, ſo I uſed it to ſecure this; but having produc'd an eryſipelas about the neck, I made a ſmall linnen bandage, compoſed of two heads, ſewed to the pellote, which, after having paſſed from before backwards, return'd forwards to be tied to the pellote. By means of this contrivance, the patient ſpoke as if ſhe had never been incommoded; but ſhe could not ſpeak without this inſtrument, becauſe without it the air did not paſs in a ſufficient quantity through the glottis. There was a neceſſity for changing this pellote every eight or ten days, rather for the cleanneſs of the bandage than that of the pellote, which might have been left longer.

Uſe of an obturator, to fill up the aperture of the ulcer, and facilitate the voice.

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REMARKS *on the Nature and Cure of the Diſorder.*

I have not look'd upon the tumor as the cauſe of the extinction of the voice, becauſe the patient had labour'd under it ſix years without its producing any alteration in her voice. It is ſufficiently known that, among the great number of women afflicted with ſuch tumors, very few have an extinction of the voice; and if ſome of them have had this extinction, there are ſo many other cauſes capable of extinguiſhing the voice, that we may ſuſpect them rather than the tumor. We even obſerve ſome of theſe tumors arriv'd at a great bulk, which neither extinguiſh nor change the voice in the leaſt. Beſides, this lady was conſiderably reliev'd by the hot and cold water, and though her tumor was deſtroy'd by ſuppuration or putrefaction, yet her extinction of voice ſtill continued.

The tumor was not the cauſe of the extinction of the voice.

The reaſons I had for ſalivating her were, her heat of urine, and the ſhankers, which her huſband had given her, and for which ſhe had been under the care of the pretended givers of ſpecifics, with whom *Paris* is infeſted, and of whom we ſhould have no reaſon to complain, if we only regarded our own intereſt. The treatment of this kind ſoon after gave proofs of its perfidiouſneſs, by puſtules, which appear'd all over the body, and which the patient treated as an ebullition of the blood. Theſe puſtules were, however, ſo well characteris'd, that a ſurgeon could not miſtake them. Theſe were, no doubt, reaſons ſufficient for ſalivating the patient; but ſuppoſing they had been unknown to me, I ſhould have then only had ſuſpicions; tho' theſe ſuſpicions had been founded on the extinction of the

Signs by which the author diſcover'd the cauſe of this diſorder.

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the voice, the quartan fever, and the character of the tumor.

The extinction of the voice, as it is well known, too often accompanies the *lues venerea*, not to excite an attention to the relations the one disorder may have with the other; especially when this extinction has no determin'd cause, continues long, resists the best indicated remedies, and disappears and returns almost indifferently, after the use of hot or cold water.

Let us examine whether we find, in the quartan fever, any thing which either fortifies or weakens our suspicions. Those who have observed a great many venereal disorders know that a quartan fever is sometimes a symptom of a pox, or, at least, that pocky patients are more subject to this than to any other species of intermittent fever. I have cured many persons, who had no other symptom of a pox than a quartan fever; and, among others, a man of sixty years of age, who from the age of forty had almost always an intermittent fever. He was salivated, by which means he was perfectly cured of his fever, and has felt nothing of it since. What determin'd me to treat him in this manner was, because, some time before the commencement of his fever, he had shankers and budoes; and because the febrifuges he had taken, according to the methods of all the different parts of *Europe* into which he had travell'd, had not been able to free him from his fever.

I do not say that it is necessary to salivate all those attacked with a quartan fever, or an extinction of voice; but since both these may be symptoms of a pox, we certainly have a right to examine the patient in this respect, and often the answers are more than sufficient to determine us. Success has confirm'd me in this thought, and I should think myself wanting in my duty, if, in similar

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milar caſes, I did not propoſe all the queſtions neceſſary to diſcover whether the quartan fever and the extinction of voice were produc'd by a venereal virus, or were independent of it. What I ſay of theſe two ſymptoms, may be ſaid of a great many others, ſuch as the cough, deafneſs, polypus of the noſe, epilepſies, ophthalmies, gutta ſerena, diarrhœas, hemorrhœdal fluxes, fiſtulas, and a great many others, which have been often, and, I dare ſay, too ſlightly, look'd upon as independent of the venereal virus. In a word, we may look upon them as produc'd by this cauſe, when the ſalivation cures them eaſily and without return, after they have, for whole years, reſiſted the uſe of remedies apparently well indicated.

The third thing on which I ſhould have founded my ſuſpicion of a pox, was the character of the tumor. I do not mean that which ſhe had ſix years, but that which ſhe ſhew'd me during the laſt months of her diſorder. This tumor, which was before ſoft, became hard, painful, and adherent to the ſkin. It chang'd colour, and in a ſmall point a fluctuation was perceiv'd in it. It had the appearance of venereal buboes, the whole of which is hard, whilſt a ſmall portion ſeems inclin'd to ſuppurate. It is true, if I had not been prejudic'd by the two firſt ſymptoms, the extinction of the voice, and the quartan fever, I might have look'd upon this tumor, which had no ſigns of a ſcrophula, as carcinomatous; but the application of cauſtics, without producing either good or bad effects, made me think differently of its nature. In a word, this tumor had been intolerably corroded for three months, without acquiring the character generally aſſum'd by carcinomatous tumors, when they are irritated by ſimilar topics. From theſe obſervations it is evident, that, though I had not been certain that this lady was pox'd, yet I ſhould have

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have had ſufficient reaſons to ſuſpect it. It is, therefore, a fooliſh delicacy, not to put queſtions to thoſe labouring under diſorders which may be ſymptoms of the pox, eſpecially when theſe diſorders have reſiſted remedies apparently well indicated.

It ſeems ſurpriſing that this diſorder was not accompanied with an emphyſema; there is, however, one reaſon for it, which ſeems natural, and which is, the largeneſs of the aperture in the *trachea*, which allow'd the air to paſs and repaſs with liberty, and without giving it an occaſion of introducing itſelf into the cellular texture of the fat or other adjacent parts. This reaſon, though highly natural, is not the only one I admitted. In order to the production of an emphyſema, it is not ſufficient that the air find a difficulty, either in paſſing or repaſſing, in the *trachea*, but it is alſo neceſſary that it ſhould find the cellular membranes diſpos'd to receive it. Various cauſes are capable of blocking up theſe cellules, even in wounds of the *trachea arteria*; but I ſhall only here ſpeak of the cauſe, which muſt neceſſarily have cloſed them up, in the caſe which makes the ſubject of this obſervation.

Why the aperture of the *trachea* was not accompanied with an emphyſema.

The air could not come out of the *trachea arteria*, except when there was an aperture in it. There could be no aperture but by the ſeparation of the gangren'd portions: the gangren'd portions were only ſeparated by the growth of the fleſh, and fleſh could not grow without blocking up the mouths of theſe cellules. Thus there could have been no emphyſema, though the aperture of the *trachea* had been ſmaller. What even amounts to a proof that it was not the largeneſs of the aperture that prevented the emphyſema, is, that this aperture was not large in the firſt days. It is true,

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if the cellules had not been conſolidated, the greatneſs of the aperture might perhaps have hinder'd the emphyſema. But the aperture being ſmall in the firſt inſtants of the ſeparation of the eſchars, no other cauſe could oppoſe the emphyſema, but the conſolidation of the cellules.

The care which in ſimilar caſes the exfoliation of the cartilage requires.

The laſt reflection, I ſhall make on this obſervation, relates to the exfoliation of the cartilage; it was therefore happy that this was made at two times, ſince, if it had been made at once, it might have fallen into the *trachea arteria*, and proved mortal. I ſhould have prevented this danger, by tying this cartilage as ſoon as I knew that it would exfoliate: This fault I willingly acknowledge; ſince it may be of ſome advantage to others, if it was only to excite their care and attention.

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MEMOIR X. *By M.* PUZOS.

On the Floodings incident to pregnant Women, the Means of ſtopping them without proceeding to the Delivery, and the Method of proceeding at the Delivery, in Caſes of neceſſity, in a Way more gentle and certain than that generally uſed upon ſimilar Occaſions.

THOUGH floodings in pregnant women may happen at all times of geſtation, yet the beginning and end of this ſtate are moſt ſubject to this accident. Cauſes of bleedings in pregnant women.

The floodings incident in the beginning of geſtation ariſe from different cauſes, ſuch as abortions, the retention of the placenta in the uterus, after the diſcharge of the fœtus, impregnations agitated by any accident, and falſe conceptions diſpos'd to expulſion.

Thoſe floodings which happen towards the end of geſtation, are almoſt always produc'd by the partial or total ſeparation of the placenta from the bottom of the uterus. The ſeparation of the placenta.

Abortion, or the diſcharge of the fœtus before its maturity, is always accompanied with a flooding, which is moderate when the uterus only expels the fœtus, but very copious when the uterus labours to expel the placenta. Abortion.

The public often accuſes thoſe employ'd in ſuch abortions, of ignorance, for leaving the expulſion of the placenta to nature, inſtead of ſeeking the means of extracting it. But this is unreaſonable, ſince it is not in the power of art, in deliveries at

two

two or three months, to obtain the diſcharge of the placenta, which may be retain'd in the uterus by different cauſes.

The placenta often remains in the uterus, when the navel-ſtring, being too weak, is not ſufficient for its extraction, and when the pains are not ſufficiently briſk to obtain that end. The placenta is alſo retain'd, when the aperture, which gives vent to the fœtus, is not ſufficient to admit the placenta. It is alſo impoſſible to extract it, when it adheres too ſtrongly to the bottom of the uterus, ſince in this caſe it is better to wait till nature delivers herſelf, than to employ uſeleſs efforts to extract it.

The placenta remaining in the uterus, after the expulſion of the fœtus, becomes an extraneous body.

The placenta remaining in the uterus, after the expulſion of the fœtus, produces a diſorder greater or ſmaller. If the placenta is entirely diſengag'd, and the uterus has ſtrength enough to engage it in the orifice of the vagina, the flooding, which may have been violent till that time, is moderated by the diſlodgment of a body, which, without nouriſhment, decays in the place where it is left, and permits the part to contract in proportion to its diminution. This contraction moderates the hemorrhage, by the immediate application of the ſides of the uterus to the extraneous body, and by the ſhrivelling up of the veſſels, which neceſſarily ſucceeds the contraction of that organ.

If the placenta is adherent, and the circulation between it and the uterus furniſhes it with nouriſhment, the flooding is ſo inconſiderable as only to be a kind of oozing; but as ſoon as nature attempts its ſeparation and expulſion, as many parts of the placenta as are detach'd, ſo many ſources are open'd for the effuſion of the blood. This effuſion is ſtill greater, when it is totally ſeparated, becauſe the prodigious number of veſſels which it obſtructed by

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by its adherence, permits the blood to flow profuſely, till the uterus is freed from that fleſhy maſs; or till, contracting itſelf, it makes it decay, and lays a foundation for its being extracted by art.

In ſimilar caſes, I have ſeen women afflicted with ſuch copious floodings, that they would have been in danger of dying, without the aſſiſtance I afforded them.

Such was the caſe of a lady, happily deliver'd of a fœtus, at the end of three months: She could not have been deliver'd by the means already mentioned. No ſymptom ſupervened from the delivery till the eighth day, on which the flooding became ſo violent, that the nurſe and people of the family began to think her life in danger. Upon being ſent for, I found all her extremities in a cold ſweat. Her paleneſs and weakneſs denoted the quantity of blood ſhe had loſt, and the danger ſhe was in. Upon examining her, I found that her pains, which had only ceaſed by the exhauſtion of the blood, had carried a portion of the placenta into the orifice of the vagina: I laid hold of this portion, agitated it gently, and brought on the pains. Theſe new pains encouraged the patient; I ordered her to uſe the little ſtrength ſhe had, and prevailed upon her ſo to do, by making her hope that ſhe would be ſoon deliver'd. Accordingly I brought away the whole placenta, upon which the flooding ceaſed almoſt immediately, and the patient was reſtored to perfect health in a very ſhort time.

I. Obſervation by the author, on a flooding occaſioned by abortion.

Falſe conceptions, or falſe impregnations, neceſſarily produce floodings by the ſudden rupture of the pedicle, by which they adhere to the bottom of the uterus, and by the efforts which that organ makes to expel extraneous bodies.

Falſe conceptions.

Theſe floodings, which are ſometimes moderate,

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and ſometimes very violent, do not, generally, yield either to veneſections, or any aſtringents, ſince it is only the expulſion of the falſe conception from the uterus, or at leaſt the removing it from the bottom of this part into its neck, which can diminiſh them*. As this ſpecies of delivery is more the buſineſs of nature than of art, we ought to make the patient take light nouriſhment to ſupport her ſtrength, and to give time to the pains and concretions to put the falſe conception in a condition to be laid hold of, when nature wants ſtrength to bring about a delivery, or even to leave it to a kind of ſuppuration by putrefaction, when it cannot be laid hold of by the forceps, and when the ceſſation of the pains and flooding makes us ſuſpect that the falſe conception can have no other termination.

II. Obſervation, by the author, on exceſſive floodings by a falſe conception.

Among all the women I have relieved on ſimilar occaſions, I have ſeen none more exhauſted than two ladies of note, in the ſame year: Each of theſe evacuated more than ſix or ſeven pounds of blood, in leſs than twelve hours, at the end of which time the falſe conceptions fell into the neck of the uterus, and were eaſily extracted.

Violent floodings, by falſe conceptions or abortions, rarely prove mortal.

I ſhould have had reaſon to be afraid, on a great many occaſions of this nature, if experience had not taught me that it is extremely rare to ſee women die of floodings, cauſed by falſe conceptions, or abortions of fœtuſes, before the fourth or fifth months, unleſs ſuch deliveries are complicated with a more dangerous diſorder, or unleſs the patient has wanted proper aſſiſtance.

This

* It is often ſufficient to ſtop the blood, that the falſe conception falls into the neck of the uterus; becauſe this part, on ſuch occaſions, lengthens ſo as to contain two thirds of the falſe conception, and to give liberty to the body of the matrix to brace itſelf up. I have ſometimes ſeen the neck of the uterus as long as a perſon's finger, and, in ſome reſpects, repreſent a ſheath or ſcabbard.

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This does not hold true of floodings which happen in the ſeventh, eighth, or ninth months; ſince theſe, tho' generally leſs conſiderable, before the delivery, than thoſe laſt mention'd, have ſufficiently taught ſurgeons the dangerous conſequences they produce, and the imminent danger of the patient; and, tho' they do not ſeem very terrible to by-ſtanders, yet too often juſtify the fatal prognoſtic which had been made, by proving mortal ſoon after the delivery.

Flooding happening near the end of geſtation.

Floodings near the end of geſtation may ariſe from different cauſes, but moſt generally proceed from the ſeparation of ſome portion of the placenta from the bottom of the uterus. This cauſe being ſuſpected, would almoſt always lay a neceſſary foundation for a delivery, if experience had not convinced us that we may, with proper precautions and remedies, ſtop, for ſome time, a flooding produced by ſuch a ſeparation; and that we ought not to proceed to the delivery till milder methods have been uſed to no purpoſe, or when the flooding is accompanied with pains, weakneſs, and ſome dilatation in the orifice of the uterus.

Cauſes of thoſe floodings which happen towards the end of geſtation.

The methods we ought to uſe before proceeding to the delivery, which can only be forced, are frequent veneſections, medicines capable of calming the effervescence of the blood, light aliments in ſmall quantities, keeping conſtantly in bed, and clyſters of warm water, to prevent the efforts the patient may make in going to ſtool. Theſe wiſe precautions have often ſuſpended, and ſometimes totally ſtop'd, floodings of blood, accompanied with ſmall concretions, not by ſodering, or again fixing the ſeparated portions of the placenta, but in giving time to the blood ſtopping at the mouths of the veſſels, to co-

Means of curing floodings in advanc'd geſtations.

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agulate, and form a kind of obturators capable of ſtopping the blood*.

A flooding, ſtop'd by ſo inconſiderable a means, and ſo ſuſceptible of a diſorder by the leaſt imprudence, requires the greateſt care and circumſpection in women. I have ſeen ſome ſufficiently wiſe to neglect nothing that was preſcribed them, in conſequence of which their deliveries have been very happy.

III. Obſervation, by the author, on a flooding about the middle of geſtation.

In 1741 I deliver'd a lady, who had a very conſiderable flooding about the middle of geſtation. This ſymptom was accompanied with pains, and a diſcharge of concretions, which are almoſt always certain ſigns that the delivery is at hand. Not content with having blooded the patient ſeveral times, I once paſſed a conſiderable time with her, expecting a labour, which I thought at no great diſtance. However, the pains being mitigated, and the flooding diminiſhed, I left her, deſiring that ſhe would conſtantly keep her bed, without ſo much as riſing to eaſe nature. My orders were punctually obey'd; the ſymptoms diminiſhed by little and little, and the flooding ſtop'd entirely at the end of fifteen days. The patient kept her bed a month after the ſymptoms diſappear'd, and her chamber all the reſt of her geſtation. At laſt, in the ninth month ſhe was delivered of a healthy ſound child, who at preſent recompenſes her for her toil and fatigue in order to preſerve its life.

This accident does not always ſucceed ſo happily, either by the imprudence of women, who too ſoon neglect the precautions preſcribed, or the inſufficiency of the means employed to ſtop the blood, or keep it ſtop'd by the ſmall concretions in the mouths of

* The proofs that the parts of the placenta, ſeparated from the uterus, do not again adhere to it, when the flooding is ſtop'd, are the frequent returns of the flooding during the reſt of the geſtation, and the concretions of blood found in the part of the ſeparated placenta after the delivery.

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of the veſſels. It is very ordinary to ſee the flooding appear again, after a ſuſpenſion of ſeveral days, or even weeks, and to perceive that the blood flows more copiouſly, than when the diſorder firſt appeared †.

When a flooding appears again, and does not yield to the means employ'd formerly with ſucceſs; when the concretions diſcharged from the uterus excite ſome pains, and dilate its orifice a little; when the flooding is accompanied with weakneſs, and when there is no longer any doubt of the ſeparation of ſome parts of the placenta, we ought to proceed to the delivery, which is then neceſſary, and muſt be performed, however little diſpoſition there ſhould be towards it; becauſe, if we ſhould commit this operation to nature, which always acts ſlowly in floodings, we ſhould loſe a precious interval of time; the mother and child might die before the delivery was at an end, and we might juſtly blame ourſelves for not having uſed a method, which is recommended by the beſt authors, and which is daily authoriſed by the preſent practice. We are ſo much the more obliged to this method, becauſe it is eaſily executed in this diſorder, and becauſe, if we are not happy enough to preſerve the mother by this forced operation, yet we often ſave the life of the child, and ſometimes both eſcape ſo great a danger.

Caſe in which it is neceſſary to proceed to delivery in floodings.

This method, as commonly practiſed, being attended with great inconveniences, and not ſecuring us from the misfortune of ſeeing almoſt as many mothers and

The author's manner of delivering in floodings.

† It is to be preſumed that the repetition of the floodings, towards the end of geſtation, augments the ſeparation of the placenta, becauſe the firſt concretions, expelled from the mouths of the veſſels, receive new layers of blood, which begins to flow; and becauſe becoming larger, they farther ſeparate the internal ſides of the uterus from the placenta, juſt like ſmall wedges, which, the more they are augmented in quantity or bulk, between two bodies, the farther they ſeparate the one from the other.

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infants cut off as preſerved by it, I thought it incumbent on me to diſcover, among the different manners of practiſing theſe neceſſary deliveries, a method which might render them leſs dangerous, and ſpare ſurgeons the grief of ſeeing women die in half an hour, or an hour, after delivery, apparently very happy till that moment.

The ſucceſs has anſwer'd the pains of my reſearches, ſince I flatter myſelf with having found a method, which, retaining a due medium between the natural and forced deliveries, better than any other, fulfils the indication of a neceſſary and ſpeedy delivery.

Before pointing out the advantage of this method, above that hitherto practiſed, I think it expedient to ſay ſomething on the abſolute neceſſity of delivery in a flooding, when it is cauſed by the rupture of any of the adherences of the placenta; and on the ſmall ſucceſs of the forced delivery, tho' eaſily and ſpeedily terminated.

Sureſt method of delivery in floodings.

In order to demonſtrate the neceſſity of delivery in a flooding, which appears in a far-advanced geſtation, when this ſymptom has not yielded to the means already mentioned, we muſt repreſent to ourſelves a prodigious quantity of ſources, open'd in the bottom of the uterus, by the ſeparation of ſome parts of the placenta. Theſe ſources, which can never be dried up, but by the bracing up and contraction of the parts, continually diſcharge blood, ſo long as the infant is included in its cavity, and whilſt nature labours weakly to expel it; ſo that we are obliged to have recourſe to the forced delivery, hoping to facilitate the contraction of the uterus, by freeing it from bodies which kept it paſſively dilated, and to obtain the contraction of the open veſſels by the ſame means, with a view to preſerve both

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both mother and infant, by an operation which fails almoſt as often as it ſucceeds.

If the ſafety of women ſeized with floodings always correſponded to the intentions of thoſe who flatter themſelves with having preſerved them, by a ſuppoſed neceſſary operation; or, if the proofs of this neceſſity were ſufficient to render us indifferent with reſpect to the lucky or fatal event of this kind of delivery, we might ſtill adhere to the practice tranſmitted to us, or reſt contented, like our anceſtors, with the ſorry advantage of preſerving ſome women from a danger, which is ſtill fatal to a great many others, notwithſtanding all our care and precaution. But, as indifferent ſucceſs is not capable of making perſons, intent on the progreſs of their art, forget the misfortunes inſeparable from a particular operation; and as I can affirm that I never thought myſelf recompenſed for the death of one woman, by preſerving the life of another, ſo I have cheerfully embraced a method of preventing the forced delivery; and I have adhered to this method ſo much the more faithfully, becauſe it has ſucceeded with me as often as I have had an opportunity of putting it in execution.

Having been often called to the aſſiſtance of women ſeiz'd with a flooding immediately before delivery, I have obſerved that thoſe who had pains ſufficiently ſtrong to allow nature to act in a labour which promiſed celerity, loſt leſs blood than thoſe whoſe pains were languid; that the augmentation of theſe pains was a means of ſtopping, or ſuſpending, the flooding, before the end of the labour; that ſuch women were very happily delivered; and that very rarely the fatal conſequences of the forced delivery diſturbed the ſucceſs of theſe natural operations.

Theſe happy events in the circumſtances where

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It is uſual to have only languid pains in floodings.

art is ſometimes employ'd with too much precipitation, made me imagine that, inſtead of having recourſe to the forced delivery, even in caſes which ſeem to require it moſt, inverting the order of nature by returning the infant, and running the riſques accompanying ſuch a violence, it would be far better to procure pains, at a time when there are generally none, or to augment them, when they are too languid to terminate the delivery in a natural manner.

This reflexion was juſtified by the happy proofs, the hiſtory of which I ſhall afterwards give; and, from that time, I was perſuaded that, tho' delivery was abſolutely neceſſary in floodings, yet this operation ought not always to be precipitate; and that it was generally more advantageous not to employ art, but with a view to approach to the order of nature, if that was poſſible, ſince this was the method which ſucceeded beſt.

Being thus determined in my choice, nothing was wanting to my diſcovery, but to find why the forced delivery, tho' ſpeedy and eaſily perform'd, was more dangerous than the natural delivery, when promoted by proper aſſiſtance, tho' more long and painful? A knowledge of the functions of the uterus, after delivery, has greatly contributed to make me diſcover the cauſe of this. It is ſufficiently known that, in both theſe deliveries, as ſoon as the infant and placenta are removed, the uterus forthwith diſcharges a large quantity of blood; that it would even permit the whole blood of the body to be diſcharged, if, by its natural diſpoſition to contraction, it was not conſiderably braced up, and if it did not proportionably diminiſh the apertures of the veſſels which diſcharge the blood; and that if, by any cauſe whatever, the contraction of the uterus is not made to a degree ſufficient to compreſs the veſſels, the blood continues to flow copiouſly; and the mother,

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ther, becoming gradually weaker and weaker, dies ſoon after her delivery.

This mechaniſm, being agreeable to the diſcoveries of anatomy, and authoriſed by experience, let us compare theſe two ſpecies of deliveries, in order to judge in which of them the contraction of the uterus muſt be made the moſt ſurely, by ſuppoſing two patients equally weakened by a flooding.

Parallel between the natural and forced delivery.

The natural delivery is when the uterus gradually, and by different degrees of force, expels the infant from its cavity, and for this purpoſe only uſes the natural pains, and the efforts depending upon them.

The forced delivery, more ſubjected to the will, than the ſtated laws of nature, is performed without waiting for pains, and without having obtained any conſiderable dilatation of the orifice of the uterus. In this method the hand compleats the begun ſeparation of the placenta, and, as precipitately as poſſible, extracts the infant and placenta.

In the natural delivery, if the pains continue and augment, and if the infant approaches to the orifice of the uterus, or is engag'd in it, we are certain that the uterus is braced up in its bottom, in proportion to the progreſs of the infant. This is ſufficiently evident, becauſe the contraction of the body of the uterus is the immediate cauſe of the pains, of the expulſion of the fœtus, and of the dilatation of the orifice.

In the forced delivery we are almoſt always certain to extract the infant from the uterus in a very ſhort time; but we cannot be certain of its contraction after the delivery, to ſuch a degree as to be able to ſtop the blood.

In the natural delivery, we have often the ſatiſfaction to ſee the flooding ceaſe, when the pains are moſt violent; for, at that time, the uterus ſtrongly applied to the fœtus, in order to make it advance,

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is itſelf compreſſed by the ſolidity of the body it contains, and which it protrudes forwards. This mutual compreſſion of the uterus on the infant, and of the infant on the uterus, muſt cloſely ſtop up the apertures of the veſſels, which are, by this means, as it were, compreſſed between two bodies, which not only touch each other immediately, but are alſo continually applied to each other, till the end of the delivery.

In the forced delivery, we ſooner put the uterus in a power of contracting itſelf, by freeing it from the bodies which kept it paſſively dilated. But we can neither communicate ſtrength to it, nor direct its contraction by ſlow degrees, ſufficiently proportion'd to its weakneſs. On the contrary, this part, being deſtitute of ſuccour and aſſiſtance, as well externally as in its cavity, by its proper force reduces itſelf from a vaſt extent, to the point of contraction it ought to have, in order to ſtop up the diameters of the veſſels, and diminiſh the effuſion of the blood: That is to ſay, the matrix muſt, after this operation, make in an inſtant about ten or more advances towards a contraction, than it does in an hour or two, in a labour brought about by nature. Now, as a great deal of ſtrength is requiſite to perform ſo conſiderable an action, and as the blood loſt before and during the violence of the operation, rather weakens than invigorates the uterus, it is not ſurpriſing to find the blood flow from veſſels remaining open in the bottom of a part without action, and perhaps as much dilated as before the delivery, and to ſee the mother die a ſhort time after an operation perform'd to preſerve her.

This parallel, eſtabliſh'd on the ſtricteſt truth, ſenſibly ſhews that we muſt neceſſarily preſerve almoſt all women, by the natural delivery, when there is a poſſibility of practiſing it; and that much fewer muſt

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muſt eſcape after the forced delivery, which is ſuſceptible of ſo many dangers.

Whatever advantage the natural birth ſeems to have over the forced delivery, I would not adviſe to prefer it, if we could not find the means of freeing it from an inconvenience, which had made it forſaken and abandon'd. This inconvenience is, the ſlowneſs by which this natural operation generally terminates: This ſlowneſs, by giving time to the diſcharge of the whole blood, may prove mortal both to mother and child, before the end of the delivery. This engaged the antients to practiſe the forced delivery in theſe caſes, and to employ a doubtful method, rather than none at all.

Method of remedying the ſlowneſs of the natural delivery.

The method of remedying the ſlowneſs of the natural, is to borrow ſomething from the forced delivery, the poſſibility of which I have often found from experience. This end, then, is obtained by dilating the orifice of the uterus with the finger, in the ſame order, and with the ſame mildneſs, as nature generally uſes in ordinary caſes. It rarely happens that a flooding, cauſed by the ſeparation of ſome portions of the placenta, does not produce a greater or ſmaller aperture of the uterus. The quantity of blood which acts on the orifice, and the concretions form'd there, are, as it were, ſo many wedges, which dilate it, and diſpoſe it to yield to the weight of the included bodies. This beginning of dilatation determines the delivery, and is ſometimes accompanied with ſlight pains. But as the weakneſs, and even faintings, which are uſual ſymptoms in floodings, are often obſtacles to the continuation of the pains, and the action of the uterus to expel the fœtus, we are obliged to reſtore theſe pains, and this action, when they are wanting; or to augment them, when they are too weak. For this

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this purpoſe, we muſt introduce one or more of our fingers into the orifice, with which we muſt labour to dilate it, by degrees of force proportion'd to its reſiſtance. This gradual dilatation, now and then interrupted, produces pains, puts the uterus in action, and both theſe inflate the membranes, which contain the waters of the fœtus. Our principal care, on ſuch an occaſion, ought to be to open the membranes as ſoon as poſſible, in order to procure the diſcharge of the waters, which diminiſhes the diſtenſion of the uterus, and furniſhes it with the means of contracting itſelf, and poſſeſſing the ſpace before occupied by thoſe waters on its cavity. The uterus being thus contracted, and diſpoſed to be ſtill more ſo, puſhes the fœtus from the bottom towards the orifice, and excites ſtronger pains, ſo that voluntary and involuntary efforts concur. The pains and efforts properly employ'd by the mother, and ſeconded by the action of the fingers, twiſted circularly in the orifice, in order to dilate it, generally ſucceed, and make the fœtus advance. The blood which was formerly diſcharged is retained in the veſſels, by the general compreſſion and contraction of the parts. At laſt, nature and art concurring to promote the delivery, this effect is generally obtained in a ſhort time; and we have almoſt always the ſatisfaction of preſerving the lives both of the mother and child, which they would have infallibly loſt, by the ſimply natural delivery, and which would have been greatly endanger'd by the forced delivery.

Foreign means added to thoſe of nature, in order to accelerate the natural delivery in floodings.

The uterus always tends to contract itſelf, and poſſeſs the ſpace of bodies expelled from its cavity.

It is therefore poſſible, on a great many occaſions, to reduce, to a natural operation, a delivery, which, on account of the abovemention'd ſymptoms, muſt have been terminated by a forced operation. But as this method might, perhaps, appear to be rather

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rather founded on theory than on experience, if it was not ſupported by obſervations, I ſhall give one ſufficient to convince thoſe who, at preſent, may poſſibly be of a different way of thinking.

IV. Obſervation by the author, on which he regulated his practice in the treatment of other ſimilar caſes.

A lady, nine months gone with child, ſome years ago had a conſiderable flooding; and, being afraid of the conſequence, forthwith ſent for me. The frequent oſcitations and weakneſs which accompanied her flooding, made me think her life in danger. I therefore determined to deliver her, tho' ſhe had no pains, on account of ſome preparation I found already made, and for fear a delay ſhould put her in greater danger. The patient took the precautions, with reſpect to her ſoul, which ought always to precede operations ſo ſuſceptible of dangerous ſymptoms. When this important work was at an end, ſhe was ſeized with gentle pains, which I encouraged and augmented, by the means I uſually employ'd; and by their help I penetrated the membranes which contain the waters. The diſcharge of theſe, which was forthwith made, greatly augmented the pains; the labour advanced, and I had the happineſs to deliver the lady of a live child; neither was the delivery ſucceeded by any ſymptom.

I have behaved in the ſame manner to other poor women, in whom I found ſtrength enough to allow nature to operate by aſſiſting her a little, and always with the ſame ſucceſs.

V. Obſervation by the author on the ſame ſubject.

A lady, wearied by ſeveral premature deliveries, was at laſt near the end of a geſtation, which, till the time I was called, had been very happy. She was wallowing in blood when I viſited her at eleven o'clock at night, and was ſo much the more frighted at her condition, becauſe ſhe felt no pains, and perceived that the flooding was augmented every moment.

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I was not, in reality, more certain than ſhe what meaſures were moſt proper, having always been afraid of the event of theſe kinds of labours. However, after having examined the ſtate of things, in order to determine me to the moſt expedient method, I found that, by preſſing on the dilatation at the orifice, occaſion'd by the flooding, I produced pains. I continued to make ſuch motions as augmented them, and at laſt procured a diſcharge of the waters. This evacuation was happy both for the mother and child, in the ſpace of three quarters of an hour.

VI. Obſervation, by the author, on the ſame ſubject.

In 1737 I was importunately begg'd to viſit a woman, who had a violent flooding near the end of her geſtation. Upon my arrival at the place, I found the patient in almoſt continual faintings, from which ſhe ſeemed only to recover, in order to tell, in interrupted words, the great danger ſhe was in. Upon examining her ſituation, I found the uterus dilated to the extent of a ſhilling. The patient had very ſmall pains: The blood which ſhe had loſt, and that which ſhe was ſtill loſing, in conjunction with the hardneſs of the circle of the orifice, made me afraid of uſing my method, and of being obliged to uſe the forced delivery, the event of which I dreaded. However, animated by the condeſcenſion and courage of the patient, I endeavoured to dilate the orifice, and made it yield gradually. The pains became ſtronger, and the membranes, before lying about the head, were inflated. It was not, however, till after an hour's labour, both on the orifice and membranes, that I could penetrate theſe laſt, and procure a diſcharge of the waters. As ſoon as the uterus was freed from theſe, it began to operate with ſtronger contractions, which made

It is ſometimes very difficult to penetrate the membranes with the finger, eſpecially when they lie cloſe upon the head of the fœtus, and are not raiſed by the waters.

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made the fœtus advance, diminiſhed the flooding, and produced ſuch efficacious pains, that the woman was ſoon after delivered. I ſupported her ſtrength by ſpoonfuls of broth, given frequently and alternately with *Alicant* wine. The infant was brought forth alive, and the mother enjoys good health ſince her delivery.

Upon comparing the good ſucceſs of dangerous deliveries, which I have committed to nature, with the fatal effects which but too often ſucceed forced deliveries, I do not heſitate to give the preference to the natural method, when the ſituation of the infant permits it to be followed; ſince this operation is more ſafe, and conform to the laws of midwifry. This method ſtill furniſhes us with another advantage, which is, that, if the bad ſituation of the infant, or other dangerous ſymptoms, ſhould render it neceſſary to ſhorten the time requiſite for the natural delivery, what we have done in order to obtain it, ſerves as a preparation, diſpoſes the orifice to yield to a more violent and ſpeedy dilatation, and renders the forced delivery much leſs painful. This happened ſome years ago to a poor woman, about eight months gone, who had a terrible flooding, and ſo frequent faintings, that ſhe was in danger of dying, before any relief could be afforded her, I and M. *Gervais* being ſent for, thought the caſe ſo dangerous, that we did not chooſe to take any ſtep till they had ſatisfied a particular deſire of the patient, which was, that ſhe might receive the ſacrament. I went to a place in the neighbourhood, leaving M. *Gervais*, who is well ſkill'd in deliveries of this kind, with the patient. Upon returning, ſoon after, I found the operation perform'd,

Reaſons for preferring the natural to the forced delivery.

The methods employ'd in obtaining the natural delivery, cannot prove injurious to the forced delivery, if we ſhould be obliged to have recourſe to it.

VII. Obſervation by M. *Gervais*, on the ſame ſubject.

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form'd, and the woman in a pretty good ſtate. M. *Gervais* inform'd me, that, having done all he could to excite the pains, and gently dilate the orifice of the uterus, there was ſuch a copious effuſion of blood, that he durſt not confide in the efforts of nature; that he took the advantage of the beginning of the dilatation to penetrate into the uterus, and extract the fœtus by the forced delivery. His operation, however, ſucceeded; tho' he had formerly try'd the natural method, in the manner he had ſeen me practiſe it.

VIII. Obſervation by the author, on the ſame ſubject.

In 1739 a lady, eight months gone, who had been happily delivered of ſeveral children, being abroad at ſupper, and having eat pretty reaſonably, ſuddenly felt herſelf ſo wet, as to become anxious and uneaſy. Upon going into another apartment, in order to diſcover the nature of the diſchatge, ſhe was in a prodigious conſternation when ſhe ſaw that ſhe evacuated blood, and that the flooding augmented every moment. She forthwith reſolved to go home; and the moſt proper method of conveying her thither, was thought to be in her own coach, where ſhe was placed in ſuch a manner as to be half ſitting and half lying. As ſhe could not be defended againſt the joltings of the coach, tho' its motion was extremely ſlow, there was ſo much blood diſcharged before ſhe got home, that not only her petticoats, but alſo the cuſhion of the coach were wet with it. When ſhe was conducted to her apartment, in order to be put in bed, there were concretions fell from her in taking off her cloaths, which reduced her to extreme weakneſs, of which I was a witneſs almoſt as ſoon as the by-ſtanders, in conſequence of the expedition with which they called me. As the flooding was accompanied with ſome pains, I found the orifice of the uterus dilated, to the extent of a ſhilling. Tho' I might have taken advantage

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tage of this aperture to perform the forced delivery, yet inclining rather to try the natural method, I gradually dilated the orifice, made the pains augment, and by this means determin'd the waters to diſtend the membranes, and to preſent them to the orifice in form of a tumor. I opened the membranes as ſoon as poſſible, the diſcharge of the waters rendered the pains ſtronger, the uterus contracted, or brac'd up in its cavity, which made the infant advance to the orifice, and from that time forth the flooding diminiſhed. The continuation of the labour made it ceaſe altogether, and the delivery was obtained about an hour after the diſcharge of the waters; the infant was dead, but the mother became gradually better, and is at preſent in a ſtate of good health.

IX. Obſervation, by the author, on the ſame ſubject.

In the ſame year a lady, about four leagues from *Paris*, ſix months gone, was ſuddenly ſeized with a flooding in her bed. I being call'd, and finding no appearance of a delivery, order'd her to be forthwith blooded, and preſcribed a ſecond veneſection next day, or the ſame evening, if the flooding required it. I enjoin'd the patient carefully to keep her bed, to uſe as little motion as poſſible, and to obſerve a regimen proper to her ſituation. The flooding ſtopt next day, but appeared fifteen days after, for which reaſon ſhe was blooded as before, and the veneſections had the ſame ſucceſs. Two months paſſed without any ſymptoms, which made the patient reſolve to come to *Paris*, that ſhe might be deliver'd with more tranquillity than ſhe could have been in the country. I permitted the journey, provided ſhe was carried in a proper litter. She arrived in town without any accident, and took bed, with a deſign to keep it till her delivery. But, ſome days after, the flooding appear'd afreſh, accompanied with ſome ſmall pains, for which I was called. After

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examining whether these symptoms were not the beginnings of a real labour, I found the uterus sufficiently dilated to make me believe that the delivery was determined. I order'd three porringers of blood to be taken from her, after which the pains being too weak to allow them to act by themselves, I labour'd, in my method, to assist nature. The orifice of the uterus being extremely hard, long resisted the gradual efforts I made to dilate it. A weakness now and then superven'd, but the return of the pains carried it off. At last I pierced the membranes, the waters were discharged, and the pains augmented by their evacuation. In proportion as the labour advanced, the flooding diminished, and the patient resumed strength and courage. This assistance, joined to the means I used, obtain'd a delivery in three quarters of an hour. The child was born alive, and the mother, after some time, recover'd her usual health.

It is proper to advertise young surgeons that floodings, which happen between the sixth and seventh month of gestation and the delivery, are subject to return, tho' stop'd by venesections, or any other means. The reason of this is because these floodings, being more commonly caused by the separation of some portion of the placenta, than by the rupture of vessels in any other part of the uterus, are only stopp'd by concretions formed at the mouths of those vessels, and not by a re-union of the parts accidentally divided. As these concretions cannot long oppose the motions of the body, the involuntary efforts of the part, and the impetuosity of the blood, we may, from the first attack of the flooding, dread the possibility of a return, the danger of such an accident, and the necessity of proceeding to the delivery, either by violence, or the labour of nature assisted by art.

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MEMOIR XI. *By M.* PETIT.

Remarks on various faulty conformations of the Anus in new-born Children.

AMONG all the faulty conformations of new-born children, the moſt common, excepting ſpots of the ſkin, are excreſcences, the hare-lip, and imperforations of the pudenda, the urethra, and anus. I have made various obſervations on theſe different ſubjects, but a recent occaſion having brought thoſe on the anus, of which I have a conſiderable number, to my remembrance, I thought proper firſt to deſcribe theſe, hoping afterwards to relate thoſe I have made on the other faults of conformation. As I ſhall only relate what I have ſeen myſelf, the reader will not be aſtoniſhed if there are ſome faults of this kind, which are not comprehended in the enumeration I ſhall make.

Want of aperture in the anus.

Some children are born without any aperture of the anus, and without the leaſt mark of ſuch an aperture; others have the part of the anus perfectly mark'd out, without any aperture; and others have an aperture into which we can introduce a probe more or leſs deep, ſuch as two or three lines, and even more. In theſe laſt the anus appears very well formed, ſo that the fault of conformation is more or leſs deep internally. I have ſeen ſome in whom the anus open'd into the bladder, others in whom it open'd into the pudenda, and others in whom, without opening any where, it form'd a tumor in the manner of an hernia.

Want of aperture of the anus in three different caſes.

I ſhall begin theſe obſervations, with thoſe on an imperforated anus, without any external trace or mark.

First caſe.

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I. Obſervation, by the author, on an infant without any aperture, or mark of an anus.

An infant was preſented to me by a poor woman, which, though it had been three days brought into the world, had not as yet evacuated its *meconium*. The abdomen was very hard, and conſiderably inflated; the urine, which was diſcharged the firſt two days, was now retain'd; the reſpiration was very laborious and interrupted; the efforts, in vain made to go to ſtool, were accompanied with convulſions, and the blood, retain'd in all the veins by the violent contractions of the muſcles, render'd the whole ſkin of a browniſh, livid, and violet colour, which diſappear'd as ſoon as the convulſive efforts ceaſed. The pulſe on this occaſion was ſmall, contracted, and ſometimes entirely loſt, whilſt at the ſame time the extremities were cold. Upon examining this poor infant, I found no mark in the place where the anus ought to have been. After due conſideration, I thought I might advantageouſly introduce a lancet, in the place between the extremity of the coccyx, and the beginning of the perinæum. The edges of the lancet being turned to both theſe places, I plung'd it ſomewhat obliquely from before backwards. I found conſiderable reſiſtance, at leaſt I did not perceive that yielding to the point of the lancet or biſtory, which in opening an abſceſs we feel, when we arrive at the ſeat of the pus; and as I ſtill perceiv'd that my lancet penetrated a ſolid ſubſtance, I inclined the point of it more, and directed it towards the coccyx, in order to approach to the rectum. Upon this I felt leſs reſiſtance, becauſe my lancet enter'd the place where the fæces were, which were copiouſly diſcharg'd, being preceded by a great deal of wind. The infant was reliev'd, but died of convulſions next day, tho' he had evacuated both the urine and *meconium*.

As I was not entirely ſatisfied with my operation,

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tion, I open'd the carcaſs, and found that what had made ſo great reſiſtance to the introduction of the lancet, was that part of the inteſtine which the ſphincter covers. It was ſo clos'd up, as to form, with the contracted ſphincter, a round and ſolid body, ſeven or eight lines in length. As I had cut it ſomewhat irregularly, notwithſtanding the care I took to follow the natural direction, I attributed this irregular cutting to this, that the large part of the inteſtine, which was conſiderably dilated in the time of operation, had puſhed this part of the anus to one ſide, ſo as to change its direction. I did not however find in the parts adjacent any diſorder to which I could aſcribe the death of the infant, ſo that I am certain it did not die by the operation. However, among all the caſes I have related, this is the moſt dangerous, both for the patient and the operator, as I have obſerved on different occaſions, when I have not been more ſucceſsful, as the reader will perceive in the following obſervations.

II. Obſervation by the author on the ſame ſubject.

Another child, in the ſame caſe with the preceding, was under the management of two ſurgeons, one of whom, having made a crucial inciſion in the ſkin and fat, endeavoured, by his finger, either to find the natural paſſage, or to make a new one; but he not only fail'd of ſucceſs, but alſo dilacerated the neighbourhood of the rectum, and detach'd it from a part of the os ſacrum, by paſſing his finger forcibly between them. The ſecond ſurgeon, who did not ſee the infant till three hours after this operation, was greatly ſurpriz'd when he did not diſcover the diſorder mentioned to him, but, inſtead of a wound, found a black tumor as large as a prune, which paſſed thro' the inciſion, and concealed it entirely from him. The operator, finding this tumor ſoft, made a puncture

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in it with his lancet, upon which the *meconium* was diſcharged, and the patient relieved; but he languiſh'd for ſeven or eight hours, and died.

Upon opening the carcaſs, I found all the parts of the abdomen, eſpecially thoſe of the pelvis, in a gangrenous diſpoſition. The rectum was open'd, in its poſterior part, about a finger-breadth above the place where the inteſtine was cloſe. I cut off the laſt vertebra of the os ſacrum, that I might be encumber'd with no bone except the coccyx, to which the anus is naturally attach'd. As the infant had diſcharg'd its fæces by the aperture made in the rectum, I blowed into this aperture, in order to diſcover to what degree theſe parts had been dilated by the retain'd matter, and accordingly found the dilatation to be very conſiderable. Having waſh'd the whole with warm water, I cut the inteſtine longitudinally, in order to ſee diſtinctly wherein the imperforation conſiſted. I attempted, but in vain, to introduce probes of different bulks. The reſiſtance was invincible, and I had even a good deal of difficulty to penetrate the center of it from within outwards, with a pretty ſmall and ſharp-pointed needle; the ſkin was more eaſily pierced. I left the needle thus introduced, and carried home with me this part, and whatever elſe could enable me to diſcover this fault of conformation, and the defect of the operations perform'd in order to remedy it. I obſerv'd in this caſe,

1. That the firſt aperture had been made between the coccyx, and the part where the anus ought to have been.

2. That the inteſtine had been entirely detach'd from the os ſacrum.

3. That the black tumor was a ſpecies of hernia, form'd by the poſterior part of the rectum, which, being puſh'd by the fæces during the infant's efforts to expel them, was with them introduced

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duced into the inciſion, where it found leſs reſiſtance than any where elſe; and

4. That the whole portion of the inteſtine cover'd with the ſphincter was entirely effac'd, without any veſtige, diſpoſition, or appearance of a cavity.

The firſt of theſe obſervations does not appear very eſſential, for we may poſſibly imagine that we have no occaſion to fall into this error, when we are acquainted with anatomy. An anatomiſt may, however, fail in this operation, when he expects to find the parts ſuch as he has ſeen them in diſſecting a ſubject, the conformation of the parts of whoſe anus has been entirely natural, becauſe the parts are very far from being always in that ſtate. For this reaſon the greateſt anatomiſts do not become ſkilful operators, till after having often diſſected indiſpoſed parts, and eſpecially thoſe affected with a bad conformation. Beſides, an anatomiſt who has only diſſected men, is not in a condition to operate equally ſafely on women, when they labour under diſorders of the parts which diſtinguiſh their ſex. In order to be ſure of our procedure, we muſt have diſſected women who have died both before and after delivery. In a word, thoſe who have only diſſected adults, may be deceiv'd in the diſeaſes of new-born children.

The ſurgeon who ſought for the anus of the infant who is the ſubject of this obſervation, ſought for it near the coccyx, where he thought it was; but he did not find it, becauſe children, in this condition, have the part of the inteſtine which ought to form the anus, much farther from the coccyx, than adults, not only becauſe the rectum, inflated by the fæces, repels the anus, and removes it from the coccyx, but alſo becauſe, in the natural ſtate, new-born children have the anus farther from the coccyx than adults; or at leaſt it appears to be ſo, becauſe there is a great portion of the coccyx,

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which, it not being as yet offified, is ſoft, and yielding to the touch, which is the reaſon that the anus, or that which ought to be it, is farther from the bony part of the coccyx in infants than in adults.

The ſecond obſervation I made on this operation was, that the rectum was detach'd from the os ſacrum, becauſe probably the ſurgeon had mov'd his finger from ſide to ſide between the rectum and os ſacrum, with a view to penetrate into the cavity of the inteſtine, which cannot be done without a cutting inſtrument; for, by only uſing the finger for this purpoſe, we ſhould ſeparate the inteſtine from all the adjacent parts, rather than penetrate into its cavity, unleſs it was gangren'd or putrefied.

We perceive, by the third obſervation, that the black tumor appearing thro' the inciſion, ought to be look'd upon as an hernia; that inſtead of opening it, it ought to have been reduc'd, and that if there had been any reſiſtance found (which was poſſible, becauſe this portion of the inteſtine might have been ſtrangulated by the ſmalneſs of the inciſion) it would have been neceſſary to enlarge the anterior angle of the wound; and the inteſtine being replaced, an aperture ought to have been made, as near as poſſible to the extremity which ought to form the anus; whereas having been open'd in the part where the tumor appeared, it was at leaſt an inch higher than it ought to have been.

The fourth obſervation ſufficiently evinces that infants, who have no external mark of an anus, and in whom nature has forgot that part of the rectum which ought to form it, are rarely recover'd. I do not aſſert that they all die, but it is certain that the fault of conformation cannot be repair'd. In a word, in all caſes of this nature, the intentions of the ſurgeon may be reduc'd to two.

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The firſt is, to give vent to the fæces; which is poſſible. But the ſecond, which does not depend on the ſurgeon, is to procure this vent or diſcharge through the ſphincter, if there is any; and this ought to be done in ſuch a manner, as that this muſcle may afterwards reſiſt, or permit the diſcharge of the excrements, without which, the infant, tho' cured, will neceſſarily have an involuntary diſcharge of his excrements; a diſorder far more terrible than death could be at ſuch an age.

Two indications to be fulfilled.

On reflecting but a little on the ſtate in which I have ſaid the part of the inteſtine which ought to form the anus is, we ſhall eaſily perceive the difficulty, or rather the impoſſibility, of eſtabliſhing this part in its natural ſtate. For here every thing appears compact, and confounded under the form of an hard chord; which preſents two inſurmountable difficulties to the ſurgeon. The firſt of theſe is, that not being able to penetrate into the center of this chord, which is very ſmall, he cannot form an anus of it; and the ſecond is, that, tho' he could penetrate it exactly, yet, in order to dilate it, it would be neceſſary to put the ſphincter in the ſtate of dilatation it ought to be in. As theſe two things cannot be executed, ſo we cannot remedy a faulty conformation of this kind. However, in order to prevent the death of the infant, the ſurgeon ought to make an aperture in the place he thinks moſt proper to procure the evacuation of the retain'd matter, and this is all he can poſſibly do.

Some days ago there was brought to me an infant in the ſame caſe with the two already mentioned, that is to ſay, when born he had neither any aperture, nor mark in the part where the anus ought to be. An inciſion had been made in the ſkin and fat: as this inciſion was too near the

III. Obſervation by the author on an infant without either aperture, or mark of an anus.

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coccyx, the operator did not find what he wanted; but he was not raſh enough to plunge his biſtory in a place with which he was unacquainted, neither had he the temerity to uſe his finger at random, as had been done in one of the caſes before mention'd. He had told the parents that his inciſion would be ſufficient, and that the retain'd matter would be diſcharg'd of itſelf. Accordingly they waited a day or two expecting this lucky accident; but perceiving that the infant was ſeiz'd with convulſions, and had its abdomen extremely tenſe and painful, they brought it to me. Notwithſtanding the deplorable ſtate in which I found it, I perform'd the operation. Inſtructed by the difficulties already mentioned, and thoſe I have always found in ſimilar caſes, I thought it proper to take a method different from thoſe I had before followed. But as I perform'd the operation with an inſtrument which every one does not as yet know, I ſhall here give a deſcription of it, that the reader may the better comprehend the manner of uſing it. This inſtrument renders the operation more gentle, eaſy and ſafe, than any hitherto known. It is a trocar, ſhorter, but much larger, than thoſe of the ordinary kind. The canula is only twelve or fifteen lines in length, its head about an inch in diameter, with a fiſſure from the aperture in the center to about a line and an half from the circumference. This fiſſure is ſufficiently long and large to permit the paſſage of an impoſthume lancet; the canula has alſo a fiſſure, equally wide on each ſide, from the head to about four lines from its end. The bodkin, when put into the canula, ſurpaſſes it in length by ſeven or eight lines. The three faces, and conſequently the three angles, form a pyramid longer than that of the

Deſcription of a trocar, invented by the author, to make an aperture in the anus.

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the ordinary trocar, which renders it ſharper, and capable of entering the fleſh with greater eaſe.

Holding this inſtrument in my right hand, I ſearched for the ſpecies of chord formed by the ſphincter, and eaſily diſcover'd it by putting the fore-finger of my left hand into the inciſion which had been made. With this finger I ſecured this chord, as much as I poſſibly could; then I plunged the trocar, and directed it towards the rectum, as well with the right hand as with the fore-finger of the left, which, in conducting it, ſecured that part which ought to form the anus, and preſented it more or leſs to the point of the trocar, in order, if poſſible, to penetrate into its center. Having ſufficiently plunged my trocar, I retracted the bodkin, immediately after which, wind, and a fluid matter were diſcharged thro' the canula. But, in order to procure an evacuation of the thicker matter, I enlarged the aperture with a pretty large lancet, which I paſſed into the fiſſure of the canula, which, as I have already ſaid, is diſpoſed in ſuch a manner, that, without drawing it out, we may introduce a lancet, or biſtory, into it, and make an inciſion as large as we pleaſe, without danger of wounding any part; becauſe the point of the lancet, always keeping the center, is always concealed in the canula. I cannot ſay that I ſucceeded in this operation, ſince the infant died next day; only I am certain that, if there is a poſſibility of preſerving life in ſuch caſes by operation, it can only be by performing it in the manner I have deſcribed. But it holds univerſally true, that this fault of conformation, is, of all others, moſt difficultly remedied by the ſurgeon.

Uſe of this inſtrument.

The caſe is not the ſame, when there is any mark or veſtige of the anus, tho' cloſe. This mark is, indeed, ſometimes ſo ſlight, that it places the ſurgeon almoſt in the ſame uncertainty as the preceding caſes.

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caſes. However, this mark, at leaſt, indicates the part where the operator ought to attempt the diſcovery of the anus.

At other times the anus is extremely well formed, and, in this caſe, we are not only aſſured of the part we ought to open, but have alſo frequently little trouble to procure an evacuation of the retained matter, and form an anus, not only neceſſary for the preſent, but commodious for the future.

IV. Obſervation, by the author, on an anus cloſed only by a membrane.

I was called to ſee an infant, who had not had a ſtool for two days after his birth. He appeared to have violent gripes, and his abdomen was very tenſe, inflated, and pain'd. They had attempted to inject clyſters, but the liquor came out in proportion as the ſyringe was emptied, which was attributed to quite a different cauſe than that which I diſcovered. When I had inſpected the infant, the firſt thing I did, in order to diſcover the ſpecies of the diſorder, was to introduce an yielding and button-pointed probe. This enter'd about an inch with conſiderable eaſe, but I could not thruſt it farther; I introduced my little finger in following the probe, and perceived a pretty ſlender membrane, which tranſverſely cloſed up the cavity of the rectum above the ſphincter muſcle. If I could have introduced a biſtory, guided by my finger, I would have cut this membrane; but the difficulty of introducing both into ſo narrow a place, with the danger of wounding theſe parts, made me prefer the pharyngotome, to which I had not then added the ſwallow-tail, as I have ſince done, in order to render it more commodious for the operation for which I contrived it. I ſlipp'd this inſtrument along my finger; then puſhing its ſpring, in order to protrude the lancet it included, I cut enough of this membrane to procure admittance to my finger, with which I eaſily made the aperture large enough; becauſe

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becauſe the membrane which blocked up the paſſage was ſlender, and made but ſmall reſiſtance. The infant went forthwith to ſtool, and continued to do ſo during the two months he lived. He did not die either of the diſorder of the anus, or of the operation. I cannot ſay whether the ſphincter performed its function, or whether it would have done ſo, provided he had liv'd. There is, however, ſome appearance that the anus would have performed its function, becauſe every time I convey'd my finger into it, which I frequently did, I found almoſt the ſame yielding and reſiſtance which are to be perceived by putting the finger into the anus of thoſe who have not labour'd under this diſorder, and on whom this operation has not been performed. I ſhould have arrived at certainty in this point, by diſſecting the body, if I had been apprized of his death.

Remark, of the author, on the different ſtates of the inteſtine when cloſed up.

I believe that, in this infant, all the local fault conſiſted in the membrane which I cut, and that the other parts, as far as the ſkin, were in their natural ſtate. The caſe is not the ſame with thoſe who want two or three finger-lengths of the extremity of the rectum: In theſe laſt, we neither find an hole in the anus, nor a canal into which we can introduce our finger. I do not know whether it is poſſible to find a canal, which has only the form of an inteſtine, without having its texture; but in all thoſe I have ſeen, who wanted a conſiderable portion of the rectum, there was not only no external hole or canal, but I alſo never found, by diſſection, any mark of a muſcle in the part of the ſphincter, nor any membrane between the ſkin, and that part of the inteſtine, where the retain'd matter was lodg'd. But of whatever kind this canal ſhould happen to be, if I found one, whether organiſed or not, I would never heſitate to perform the operation I have deſcribed;

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ſcribed; becauſe, if this portion of the canal is not an inteſtine, it is at leaſt a paſſage, which, being open in its bottom, will always permit the evacuation of the fæces, provided that with an inſtrument we luckily light on the end of the inteſtine which includes them. I ſhall give the remainder of theſe different faults of conformation, which are very numerous.

V. Obſervation by M. *Engerran* the younger, on a cloſe anus.

On the 20th of *March*, 1740, M. *Engerran* was called to viſit an infant, born about four days before, who vomited up every thing he ſwallow'd, but diſcharged nothing by ſtool. From this, M. *Engerran* concluded that the rectum was cloſed up. He examined the infant, and found in the orifice of the anus a ſuppoſitory of ſope, which he extracted. He introduced into the entry of the anus a groov'd probe, which was ſtopp'd by a kind of hard body, that thruſt it back when the infant made an effort to go to ſtool. M. *Engerran* knew, from this reſiſtance, that the rectum was cloſed. He ſlip'd into the groove of the probe, a trocar; this open'd a paſſage for a great deal of the *meconium*, which was forthwith diſcharged†. M. *Engerran*, by means of a lancet fixed in a proper caſe, enlarged the aperture made by the trocar. The infant was greatly relieved by this operation, and continued to go to ſtool for about a month. However, new ſymptoms ſupervened, and induced death.

M. *Engerran*, on opening it, found, at the extremity of the rectum, a knot, like the navel of an adult. This knot had reſiſted the trocar and lancet, which had only penetrated the moſt ſlender part of the rectum above the knot; ſo that the operation was imperfect, becauſe the aperture was not ſufficient

† M. *Heiſter* ſays that, in 1714, he, in a ſimilar caſe, uſed a trocar, but that his operation did not ſucceed. *German Ephemerides*, Cent. 3 & 4.

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cient to give vent to the reſt of the matter, which being retained, prov'd mortal to the infant.

From this M. *Engerran* underſtood that it would have been expedient to cut the knot, by means of a two-edged biſtory, directed by the trocar above deſcribed. However, he makes ſeveral judicious remarks on this operation: He ſhews, for inſtance, that the biſtory he propoſes cannot be uſed, except when we are ſure to find the knot to be cut; for it is eaſily conceived, that, when this knot exiſts, it may not be placed, with reſpect to the aperture, on the ſame ſide in which he found it; and if it was neceſſary to ſearch for it before or behind, to the right or left of this aperture, we could not, without difficulty, light upon it; and the difficulty would be ſtill greater to lay hold of it, ſo as to cut it. It would, therefore, be more ſure to make an aperture ſufficiently large to ſeek for it with the finger; and when once it is found, the finger would be more proper than the trocar for conducting the biſtory. But the trocar we have deſcribed is very commodious, in ſuch caſes, to extend the aperture to a degree ſufficient to admit the finger. M. *Engerran* does not indeed think that the ſucceſs of the operation depends on cutting preciſely the knot that terminates the rectum, becauſe we cannot hope that there will be an anus, with its organic parts, form'd, rather by cutting preciſely in the part of the knot, than at its ſide; thus, it ſeems, the moſt eſſential circumſtance of this operation, is to make a ſufficient aperture, ſuch as is placed favourably to procure a total evacuation of the matter, and to preſerve this aperture. For this reaſon our trocar is ſtill the moſt proper inſtrument, for making this aperture, and for enlarging it ſufficiently. We may judge, from the reſiſtance of the knot, to the inſtruments uſed by M. *Engerran*, that it is often very difficult, as he obſerves, to penetrate

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trate the extremity of the rectum, in the part where it is closed, and forms a solid body. It is, no doubt, for this reason, that *Riolanus*, in such cases, despairs of the success of the operation*. However, we find in *Hildanus*†, *Saviard*‖, and *Mangetus* §, examples of similar operations performed with success, even in cases where there was not externally the smallest appearance of an anus; but it must, nevertheless, be confessed that these examples are very rare.

* *Enchirid. anatom.* Lib. 11. Cap. 33. † Cent. 1. Observ. 73. ‖ Observ. 3. § Tome 2. pag. 500.

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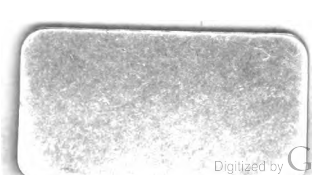
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